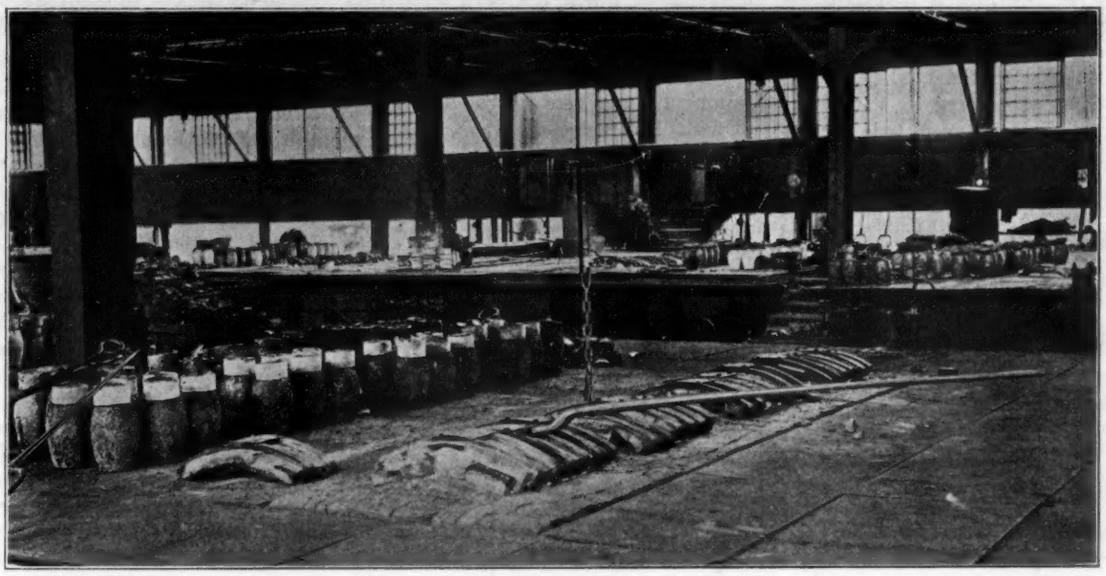


Making High Grade Steel-I

European and American Adaptations of Huntsman Crucible Process Differ—Coke-hole Furnace, Discarded in United States, Survives in England

By John A. Coyle

MAKING high grade steel is an art rather than a science. The term "science" presupposes exactitude and absolute control, which factors certainly cannot properly be credited to the manufacture of fine steels.

Therefore the maker of high grade steel is an artist, not a scientist. Imagine turning out Whistler paintings on a printing press or throwing a lot of variegated colored yarns or silks into a machine and producing a Warwickshire, an Irish or a Persian tapestry!

Before the advent of high speed steel—that Trojan of industry—the demand for better steels was supplied by what was known as "crucible cast steel, warranted." While this classification was used as a label by various tool steel makers, it is employed here to designate steel guaranteed as having been made in crucibles.

To show that there is much of artistry in making fine steel it is not necessary to go back farther than the discovery of Huntsman, who, seeking better springs for use in clocks, determined to melt cemented bars of puddled iron in clay crucibles and secured in this way a more homogeneous product than that obtained by the fusion of carbonless iron with carbon scraps.

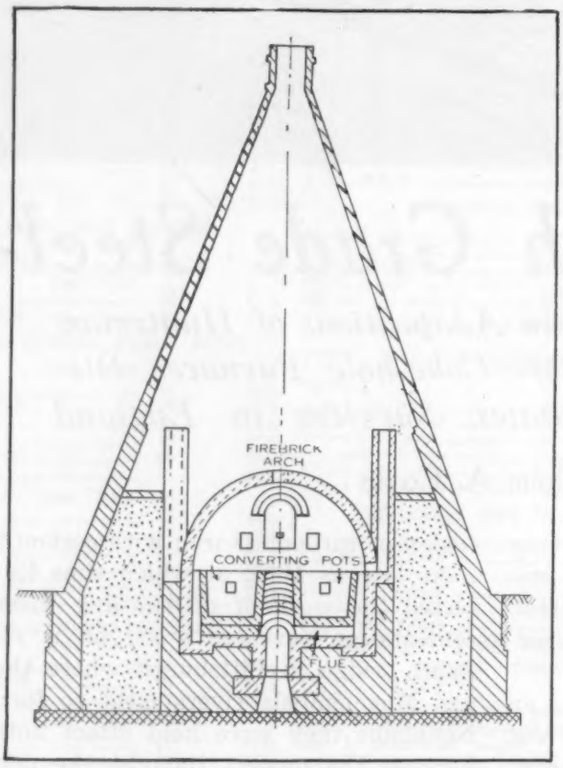
As late as 1905, at which time the author directed the work of dismantling them, a row of cementation furnaces stood on a site near the Point bridge in Pittsburgh where the Allegheny and Monongahela rivers meet to form the Ohio. No doubt they were held intact until that time because the owners thought the demand might revert to ingots melted from a crucible charge of cemented or blister bar. However, improvements in the art had developed, as prior to tearing down these furnaces it was found possible by using black oxide of manganese, ferrosilicon and ground charcoal, to quiet the metal and get an acceptable percentage of ingots "on carbon."

This was an important consideration at that time as there were inventory dates when a "write-off" of 33 1/3 per cent of crucible ingot stock as "off-carbon" would have to be made, representing a serious reduction in the worth of inventoried plant and stock. This came about because of the existing practice of casting or teeming one-pot or two-pot ingots or multiples of one or two pots. The later and more modern practice of casting or pouring the contents

THIS is the first of a series of related articles on the manufacture of fine steels. The author, consulting engineer, Pittsburgh, writes from 25 years experience—Editor.

of pot after pot into a bottom-opening ladle, instead of teeming individual molds did away with the heavy "write-offs" but added to the quality hazard and cost of processing.

In Great Britain even today careful steelmakers use cemented or blister bar in making Huntsman or crucible steel. The iron used usually is Swedish puddled muck bar in rolled or hammered (squeezed or shingled) form. The shingled bar is freer from slag or cinder, and consequently has fewer impurities. These bars are heated for several days in boxes packed with charcoal, the bars taking carbon from the charcoal during the heating process. The tops of the boxes are cemented on, hence the term. A modification of this method employed in America consisted of packing the bars in alternate layers of lime, charcoal, bars, charcoal, lime and so on progressively.



Section Through a Cementation Furnace

Take Off Test Bars

Tap, trial or test bars periodically are withdrawn from the charge through a slot in the box and when cold are broken for examination of fracture. By this means it is estimated whether or not the carbon absorption is complete.

Three weeks are consumed in charging, cementing and unpacking the and set on stands in coke holes or furnaces. The stands stick to the pot bottoms, which come out when the boxes after which the bars when cold are broken and graded for carbon content. The product is classified in six grades ranging from No. 1, containing 0.5 per cent carbon up to No. 6 with 1.5 per cent.

British Use Clay Pots

The British steelmakers use crucibles of clay, which permit closer control of carbon in the ingots, as the clay pots do not "throw" varying amounts of carbon as it is claimed is the case when graphite crucibles are employed. The pots are preheated crucibles are withdrawn or "pulled" for teeming, allowing grates to be cleaned readily. One workman holds a funnel while another introduces the charge through it. The melter examines the furnace during the melt and gives instructions as to regulating the draft. At intervals he feels the contents with an iron rod to determine the state of the heat, gives final orders regarding the draft, and proceeds with the completion of the melting and killing of the metal. Killing means supersaturating the metal with heat so as to allow the slags and non-metallic impurities to rise and entrapped deleterious gases to escape, permitting a quiet and clean metal.

In Great Britain the first charge may be 60 pounds, the second 54 pounds and the third 48 pounds so as to lower the slag line with each successive melt. Otherwise the fluid metal would cut through the walls and possible cause the loss of steel.

Huntsman or crucible steel first was made in coke-hole furnaces and in Great Britain and on the continent this unit is employed today, although it seems to have been discarded permanently in America. The coke-hole furnace as developed in Germany and United States was a square chamber of fire brick on a common brick foundation. The chamber tapered up to a small opening. Bearing bars were built in at the front and back between the fire brick walls and the foundation (between the fire chamber and ashpit) to support grate bars which could be withdrawn from the front of the ashpit in order to drop cinder or ashes from the coke. A flue extended from the fire chamber to a stack to create draft for combustion, regulation being accomplished by closing or opening the ashpit door. With such a crude means of controlling the atmospheric-hydrometric conditions, it is apparent making steel in this way was an art.

The coke-hole furnace of Great Britain differs from those of Germany and the United States in that it is rammed ganister surrounding a built-up form, oval in shape and tapering from the ashpit to the cover opening. Two openings are provided in the flue leading off at the back, one from the ashpit and the other from back of the pot. This arrangement affords a better control of the draft.

In German and American practice stands made of the inverted bottom halves of old crucibles were provided. Sand was sprinkled over these stands to prevent the pots from adhering to the stands. The fuel was hard burned clean coke, preferably of the highest Btu. value, free from sulphur and without tendency to form ash. It should burn freely and distintegrate as it burns, falling to the grate bars in as light and powdery form as possible so as to preclude the use of a slice bar to clean the grates. The author has used coke so clean that it was not necessary to touch the grates during a heat, and on the other hand has encountered fuel so cantaminated with impurities that it formed shelves of clinker around the pots, disturbing the draft, freezing the metal and causing untold difficulties.

Materials for Crucibles

The ideal crucible is made from a mixture mainly clay; in England Stourbridge, China or others with crushed coke; or in America of West Virginia, Georgia or others (sometimes imported) with crushed coke.

In both countries the mixture is designed to prevent throwing of the carbon from the pot walls. The manufacture of clay pots is a delicate and discriminating art and one not extensively practiced in the United States. They are set on shelves back of the furnaces for curing and before using for melting are annealed, being charged in the coke-holes as already described.

Americans Use Graphite Pots

With the discontinuation of the almost general use of coke-hole crucible furnaces in America in favor of the Siemens crucible furnaces of the present day by nearly all if not all American crucible steel manufacturers, the clay pot or crucible fell into almost general disuse, and, after many vicissitudes and much experimenting, the graphite crucible was adopted and many companies were formed to manufacture them. They are not as breakable as clay crucibles, hold a heavier charge uniformly, because of a less quickly impaired slag line and while not cheaper if as cheap per ton of steel melted as clay crucibles, less man power is used in their handling, while they do not turn out as high a per cent of ingots "on carbon" as do clay pots this is not as serious a matter with ladle cast crucible heats as it was with individually teemed or poured single or two pot ingots or their multiples, as while the throw of carbon by pot walls will range ordinarily from nearly zero to as high as thirty-eight points, ranging from that down to ten points with an all iron charge, the character of charge largely governs the throw.

Analyses of American and German graphite pots follows:

	American per cent	German per cent
Graphite	47.40	46.75
Silica	36.20	32.72
Alumina	12.75	16.09
Ferrous oxide	1.90	1.56
Calcium	0.50	0.45
Magnesia	0.20	0.16
Titanic acid	0.55	0.86
Alkalies	0.50	0.21
	100.00	100.80

There are some few graphite crucibles made in Great Britain. They differ from the American product in that they are taller and of smaller diameter, they are glazed inside and out instead of being "dry" burned, and weigh a little lighter, having thinner walls.

Charging the crucible calls for a high degree of skill and judgment. The melting bar usually is charged on the bottom on edge when carbon-free irons are used and cemented bar not a part of the charge. The scrap is scattered on top and into the interstices of the whole, as the scrap melting at a lower temperature trickles to the bottom around the melting bar, forming a little pool in which the carbonless iron finally will go into fluidity.

Artistry is shown in lowering the heat below the killing temperature so as to have the metal fit to pour, yet at the same time as nearly the same volume as when solid and cold. Otherwise excessive shrinkage will take place, resulting in a defective product and excessive wastage. To explain this relation of volumes, it may be said that volume of the fluid steel in the pot being 100, the same steel when solid will have a volume of 79.36. This will vary in accordance with the chemical make-up of the metal and the speed with which it is teemed.

On withdrawing the pots from the furnace, they are quickly moved to a point near the ingot molds or ladle. The caps are removed and a rod or stick (flux swab) is revolved in the metal to remove the non-metallic top coating and to insure a clean stream of metal. If the metal is poured into a bottom opening ladle, then the swabbing is dispensed with as the coating of flux collects on top of the ladle and forms a sometimes beneficial protective coating against too rapid cooling.

In teeming metal into ingots the stream is carefully directed so as to prevent splashing on the sides of the molds, which causes scabs or slivers on the ingot. These in turn cause further defects in the products as they become accentuated in the mechanical processing.

In the case of one-pot and two-pot ingots, the practice of grading by visual analysis is done after a small corner has been chipped off the ingot. Its fracture is kept clean for carbon reading, and each corner and its ingot are numbered. The corners are submitted to the ingot grader for classification, after which the ingot grades are marked on the sides of each ingot, as for example "Reg. B.W.;" "Best H.S.;" "Common X Cut;" etc. While these classifications are of a special cutting steel, the tool grades are marked: "Reg. Tool 2¾" or "Special Tool 3½;" or even "Extra Tool 3," the numerical indices referring to the carbon range only.

In best practice the ingots are aged before they are used as this affords the steel an opportunity for its mass formation to free itself from cleavage plane, inter-knitting, molecular affinity strains. While this is not always done or has wide publication, it has been privately accepted by many workers and is practiced by discriminating steelmakers.

Detail in Cost of Huntsman or Crucible Steel

	Pre-war period	Probable cost, 1925
Fuel	$1.33	$2.35
Crucible ingot molds	.84	1.48
Medicine	.13	.23
Bottom coke	.15	.27
Pipe brick	.31	.55
Sundry supplies	.53	.94
Crucible clay	.12	.21
Crucible pots and caps	6.88	12.13
Wages		
Fixing crucibles	.41	.72
Common labor	1.86	3.28
Incident to inspecting ingots	.34	.60
Scrap cutters and weigh-ups	1.20	2.12
Melting	5.44	9.61
Repairs to furnaces and heating apparatus	.58	.99
Repairs to machinery and tools	.27	.48
Total	$20.39	$35.96
Average heats per pot with shaker		7.58
Average heats per pot without shaker		5.86
Per cent of pots lost		.47
Average weight of steel per pot, pounds		6.95

Standardize Die Heads

Comparison of stock lists by leading manufacturers of die heads and chasers, resulted in discovery that these lists could be reduced from over 2000 chaser varieties to about 200. The standardization, efforts toward which were instigated through the standardization committee of the American Society of Mechanical Engineers, will follow the American or National standard screw thread recommendations, except where odd shapes and pitches are in widely accepted use. This action follows and strengthens similar action by machine screw-makers.

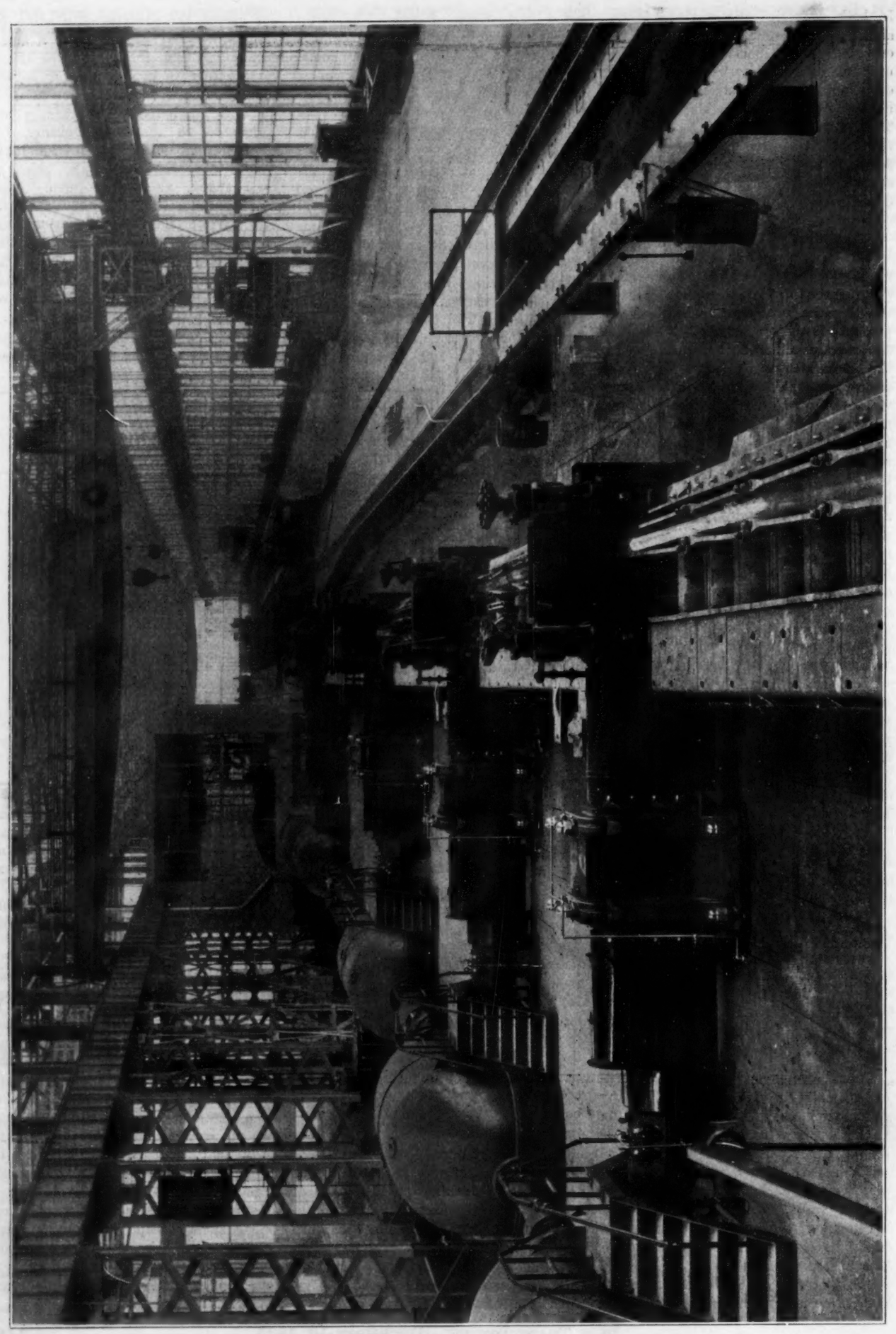


Fig 1—A general view of the 14-inch continuous bar mill of the Ford Motor Co., River Rouge, Mich. Eight of the roll stands are shown

Rolls First Steel Bars on New 14-Inch Mill

WITH the placing in operation of its new 14-inch continuous bar mill on Friday, Nov. 27, the Ford Motor Co. came one step closer to the realization of its plans to direct within its own organization every process of manufacturing from the raw material to the finished product. This latest development at the River Rouge plant is destined to effect a large saving through economies. Except for a few company officials who were present and the cutting of several short pieces from the first bar for souvenirs, the opening of the mill was unmarked.

The new mill was built by the Morgan Construction Co., Worcester, Mass., is electrically operated and consists of six stands of 18-inch rolls and four stands of 14-inch rolls. It will produce bars of various sizes from steel made according to company specifications and intended for the manufacture of many separate parts in the assembly of cars. The first material to be rolled was for rear axle shafts. Billets 4 inches square and 14 feet long were used and after rolling into rods were slightly more than 1-inch in diameter and approximately 160 feet in length.

Billets are heated in an oil-fired heating furnace such as is shown in Fig. 2, and are brought to around 1900 degrees Fahr. before being removed and placed in the mill. The general view of the mill, Fig. 1. shows eight of the roll stands and the power lineup. The installation is notable for its completeness of cranes and other labor saving devices and neatness of installation featuring all Ford plants.

The rolling mill which has a capacity for handling between 15,000 and 20,000 tons of steel a month, is the first unit of the steel plant to start operations. It has been completed for a number of weeks but could not be operated because of a temporary lack of electric power at the River Rouge plant. The Ford company just recently completed the installation in its power house of two new turbogenerators of 16 000 kilowatts each, these units being designed by the company's engineers and built in the company's own shops. Several more generators of the same type are in course of building.

Four 100-ton open-hearth furnaces now are under construction in a separate building at the heater end of the mill building. Production of these units will be reinforced by four electric furnaces. It is expected that the open-hearth plant will begin to function as a whole about next April. Steel from the open-hearth furnaces will be cast into ingots which will be converted to billets and passed through the 14-inch mill. In the meantime, rolling mill operations will be caried on with billets purchased from outside sources, the first billets for this purpose having been purchased in the open market. Production will be increased monthly so that when the remainder of the plant begins to function, the mill will be ready to care for all output of the furnaces.

The steel plant is housed in a building 460 feet wide and 1500 feet long the construction of which is unusual. The high side walls are of

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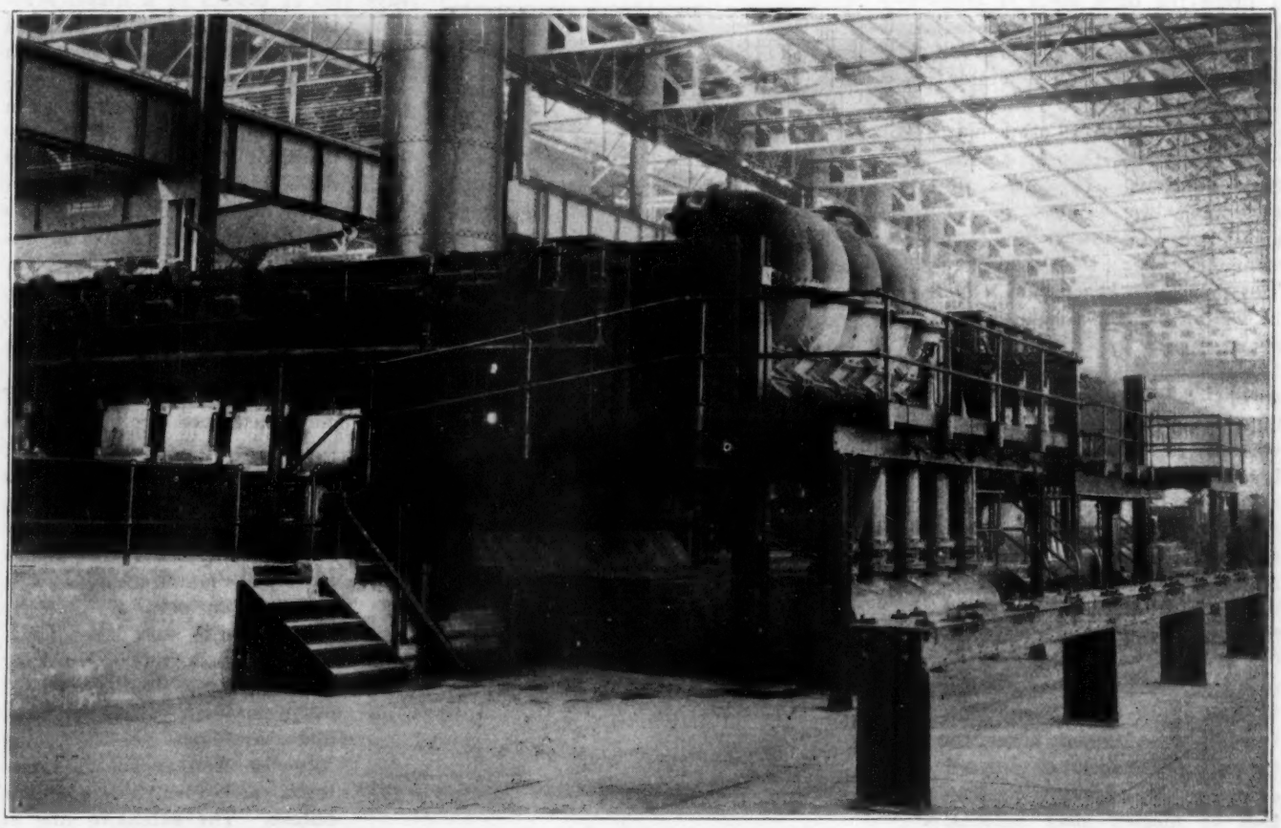


Fig. 2—Billets are heated to about 1900 Degrees Fahr. in a heating furnace of the oil-burning type

Large Uses of Steel In Small Ways

THE use of steel in the manufacture of buttons seems to be declining but the industry still calls for a relatively heavy tonnage which may be increased at any time through a whim of dress styles. The term buttons is rather broad. It is here considered to mean chiefly those used as part of clothing.

The use of steel in button manufacture falls into three main classes. The first is nickled steel buttons, used largely as trimming for women's clothes. The smooth steel wafer known as a sequin comes in this class. The second class in point of tonnage covers cloth buttons and it is here that the deepest inroads have been made into steel consumption by changing styles. The third class covers fancy metal or brass buttons. This includes uniform buttons, metal buttons for children's clothing, and all of the cheaper grade of so-called brass buttons. Even in those actually made of brass the back piece is frequently steel. Government records show the annual value of buttons produced in the United States is about $50,000,000, but the proportion of steel to other materials is not definitely stated. Shoe buttons contain some steel, but the amount is so small that they are not considered under this heading. The decline in the use of steel in this industry is clearly shown from the fact that in 1914 more than 15,000,000 gross of shoe buttons were made in the United States, whereas at present one of the largest manufacturers estimates not over half a million as the total production, or about 3 1/3 per cent. Approximately 3,000,000 gross of covered steel buttons were made in 1914 compared with 2,000,000 for 1924. The steel button manufacturing industry centers in New York and Connecticut. One of the largest manufacturers, a Connecticut concern estimates the present production of nickled steel buttons, including sequins, at 200,000 gross per year, which seems a conservative figure in view of government statistics. These buttons range from ½ to 1 pound per gross and perhaps average ¾ of a pound, which for 200,000 gross would give a total weight of 75 tons.

These are made of soft cold-rolled steel strip in coils the width of three or four or more buttons. These coils are fed into gang sets where they are blanked out, 20 or 30 at one operation. In some cases the blanking process pierces the holes, while in other cases, even in modern production shops, the piercing is performed in a second operation in semi-automatic machines which, nevertheless, require considerable hand work in feeding the magazine chutes. Whatever the process, pierced blanks are tumbled to remove rough edges. They are then case hardened, again tumbled, then put through a nickel process which consists of agitating large trays full of blanks in a nickel solution. They are then polished by tumbling in barrels with sawdust. Covered buttons consist of two parts known as a shell and a collet. These are made of soft cold-rolled strip steel which in most cases is 0.008 inches thick. The pieces are blanked and formed in one operation on special collet machines. The smaller sizes, however, are made on eyelet machines. The collets have a small hole punched in the center through which a bit of cloth is forced. This cloth is then held in place in the collet by a cardboard disk which is pressed against the turned-up collet edges. In this form the shell and the collet are shipped to small manufacturers who make a business of covering buttons with any desired material. An ingenious covering machine stretches the cloth or other material over the shell and then presses the collet into the shell to hold the material and form the complete button. The extensive line of campaign buttons which in the

Buttons

THIS is the fifty-third of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the great American tonnage.

The first article on "corsets" appeared Nov. 22, 1923. Other articles appearing fortnightly since are:

Pins	*Razor Blades*
Cotton Ties	*Pens*
Toys	*Steel Wool*
Spinning Rings	*License Plates*
Card Clothing	*Hypodermic Needles*
Tie Plate	*Shoe Steel*
Tacks	*Crushed Steel*
Knives and Forks	*Skates*
Surgical Instruments	*Needles*
Fence Posts	*Phonograph Needles*
Eyeglass Cases	*Golf Clubs*
Fishing Tackle	*Mechanical Pencils*
Dental Drills	*Burial Caskets*
Pocket Knives	*Telephones*
Rat Guards	*Radio Towers*
Snap Fasteners	*Brushes*
Paper Clips	*Electric Bells*
Steel Vests	*Bookbinder Wire*
Electrical Conduit	*Sucker Rods*
Radiator Furniture	*Watch Hands*
Notebooks	*Steel Furniture*
Metal Beds	*Highway Markers*
Bolts and Nuts	*Camp Cots*
Metal Lath	*Flexible Shaft*
Tin Cans	*Wood Pipe*
Umbrellas	

BUTTON BLANKS ARE PUNCHED MANY AT A TIME

main consist of wire covered with celluloid, are more properly considered pins and are not included in this survey of buttons. The present production of cloth and leather covered buttons used for clothing and upholstering is about 100,000 gross a year, and the average weight is approximately 1 pound per gross, which gives a total weight of 50 tons. One Connecticut button manufacturer makes a specialty of a patented bachelor button, and reports using 20,000 pounds of steel for this item each year. So-called brass buttons, when made of steel, are stamped out of soft cold-rolled strip in a process similar to that used for the shell and collet of covered buttons. In this case the collet and shell are pressed together without the covering material and the shell is usually embossed with an ornamental design. The collet or back of the button usually has an eye formed in its center either by pressing the metal or by inserting a wire with a loop which projects through a hole in the center of the collet. The tonnage under this third class falls between 40 and 50 tons a year, bringing the total steel used in the manufacture of clothing buttons in United States to 175 tons.

Flexible Steel Lacing Co., Chicago, has increased its capitalization from $25,000 to $500,000. Stein, Mayer & Davis, 1633 First National Bank building, are correspondents.

Investigates Steel for Mine Timbers

A committee to study the use of structural steel for mine timbers has been appointed by the American Mining congress. This committee will consist of: M. D. Gibson, Bertha-Consumers Co., Pittsburgh; R. L. Twitchell, Carnegie Steel Co., Pittsburgh; H. W. Montz, Lehigh Valley Coal Co., Wilkes-Barre, Pa.; J. M. Clark, E. E. White Coal Co., Glen White, W. Va.; D. W. Blaylock, Madison Coal Corp., Glen Carbon, Ill.; F. H. Frazier, Maher Collieries Co., St. Clairsville, O.; George J. Hahn, Lorain Steel Co., Johnstown, Pa.; and George O. Richardson, Bethlehem Steel Corp., Bethlehem, Pa.

Shows Forging Machines

For the purpose of carrying its recent second exposition of forging machinery to those unable to attend the National Machinery Co., Tiffin, O., has prepared an elaborate book showing the progress in machine forging equipment. The 20 pages of the book are used to show actual installations of the various machines manufactured and samples of the work that can be accomplished. Several views taken during the exposition, Aug. 24-27, also are shown in the book.

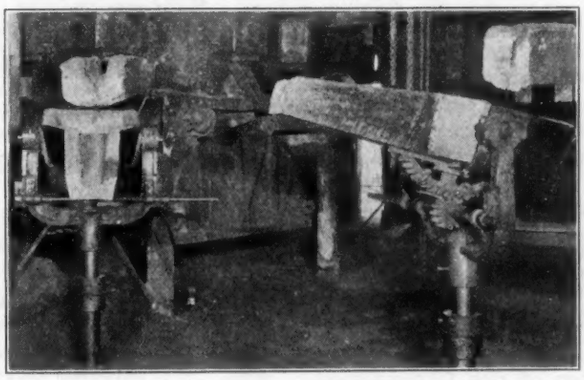
Potash Recovery Declines

The problem of profitably reclaiming the potash in flue-dust continues baffling to furnace operators. This product seems to have had its day during the war, when because our potash supply had been shut off, it sold at $6 to $8 a ton. Since then all furnace operations have been keenly conscious that the material is there. But few have been able to do anything worth while with it. One furnace interest lets the farmers come in and take it away for $1 a load to use as fertilizer. Another interest has been doing some experimenting with the flue-dust with a view to ascertaining what profitable disposition can be made of it. Another furnace has been able to sell some of its dust to a fertilizer manufacturer but at a price that paid nothing more than the expense connected with saving and loading it. This company now is saving its dust in the hope that it ultimately will accumulate a tonnage of sufficient size to justify treatment of the material. Inasmuch as this dust is accumulated at the rate of about one ton to every 5000 to 6000 tons of pig iron, the process of accumulating it is slow.

Designs Tilting and Revolving Reservoir Spout

SEVERAL interesting features are connected with the tilting and revolving reservoir spout device submitted by D. McDaniel, Hamilton Foundry & Machine Co., Hamilton, O., in connection with the Obermayer contest conducted by the American Foundrymen's association. That company found it necessary to tap the cupola into a 1500-pound ladle suspended from a bridge crane and into several 500-pound ladles traveling on a trolley. A mixing ladle had been used, and the trolley arranged so that the iron could be poured directly from the mixing ladle to the other ladles. However, the necessity for hotter iron suggested the elimination of the mixing ladle and the pouring into the smaller ladles from the cupola spout. This meant stopping the cupola after each ladle was filled, or cutting into the stream of molten metal with the unwieldly 1500-pound ladles. A double tilting spout, commonly used in foundry practice, was considered, but a device of this nature could not be placed to serve satisfactorily the crane ladles and the trolley ladles.

To overcome this difficulty, the tilting and reservoir spout, shown in the accompanying illustration, was designed. The device consists of a special spout mounted on a revolving trunion. The discharge end of the



spout is of usual dimensions, but the portion at the back is widened out so that a quantity of metal may be carried in the reservoir thus formed, when the spout is tilted upward. This arrangement allows the flow of iron from the cupola spout to accumulate in the tilting spout long enough to change ladles or to turn the spout from the filled ladle to the empty one. With minor changes this apparatus may be used to pour molds direct from the cupola, where the molds are delivered to the pouring station on conveyors.

A LEGEND OF METALLURGY

"The Goddess of the Pole Star, Descending from the Starry Firmament became enamoured of a mortal, Siderite, but he, loving none but his brother, Sidere, repulsed her. In her wrath she transformed the devoted brothers, one into stone and the other into iron." From the poem "Ferrum" written in Latin by Father Xavier de la Sante in 1772, translated in 1906 into French verse by the late Prof. F. Osmund, and into English by L. P. Sidney.

This bronze group was prepared for Sir Robert Hadfield by the sculptor, Frederick J. Hanlon, and was exhibited at the Royal Academy, London.

Words, Study; Then Manganese Steel

Translating French Pamphlet on Alloys, at Age of 19, Gave British Metallurgist His Inspiration That Led to Great Discovery

By Sir Robert Hadfield

IT IS interesting to recall how important was the work accomplished by the guiding spirits of the Terre Noire Co., M. M. Euvorte, Pourcel and Gautier, in originating and making possible the cheap production of rich ferromanganese, without which modern metallurgy could not exist. During the great war the enemy was probably under no greater disadvantage than their inability to obtain adequate supplies of ferromanganese.

When visiting the Paris Universal exhibition in 1878, at which time I was 19 years of age, I was presented by the Terre Noire Co. with a copy of their most interesting pamphlet, which was headed "Terre Noire, La Voulte & Bességes, Foundry and Ironworks Company's History and Statistics of the Company, Catalog of Exhibits and Other Information," covering some 60 pages. The whole of this, with the useful tables of tests, I translated into English. It was the carrying out of this translation which I believe helped largely to influence and turn my mind into the channel of the study of alloys of iron with other elements.

The company was founded in 1819, and licensed by royal mandate on Nov. 13, 1822. From 1822 it was carried on under the title of "La Loire and Isère Co." In 1839 a royal mandate assented to the title of "La Loire and Ardèche Co." which title was kept until 1859, in which year a further decree was obtained, and the company took its later and present title.

Until 1862 the company devoted its entire attention to the manufacture of cast iron and ordinary irons made from Ardèche and Bességes ores. In 1862 the manufacture of bessemer steel was commenced at the works, and the Terre Noire company, being the first in France, secured in 1868 important contracts for rails with the Paris, Lyons and Mediterranean Railway Co. In 1868 the Siemens-Martin process, which made its appearance, was adopted and underwent large developments.

The manufacture of extra soft steels was begun in 1868, thanks to the aid of "rich manganese alloys," the initiation of which was rightly claimed by this company. In 1875, again by

the aid of manganese alloys, the company introduced a method and worked this for a short time of using old materials, such as rails containing small amounts of phosphorus, so that they might be worked up into steel rails, provided the carbon present was not too high. In 1875 the manufacture of ferromanganese made further strides, and alloys were obtained in the blast furnace containing 81 per cent manganese.

From 1870 to 1880 the Terre Noire company made a series of experiments which led to its being one of the first to produce the practical and everyday manufacture of cast steel without blowholes, destined to render great service to industry. This manufacture necessitated the employment of silicious pig irons; these were obtained in their own blast furnaces, also the alloy known as silicon spiegel, containing iron, silicon and manganese.

A long series of tests were made upon rolled and hammered steel, both on the raw and oil-tempered metal, and in some cases water tempered, containing different percentages of carbon, from 0.15 to 1.05 per cent. These included bending, drop, tensile and compression tests.

A series of tests also were carried out upon rolled and hammered steel containing different percentages of manganese, commencing with 0.52 and up to 2.45 per cent. Similar tests were carried out on treated and untreated material, as with the carbon steel.

Then followed a series of rolled and forged steels containing different quantities of phosphorus, from 0.24 to 0.39 per cent.

Important researches also were carried out upon a continuous series of cast iron, mixed metal, and steel without blowholes, or soufflunes.

A magnificent collection of its various specimens was exhibited by the Terre Noire company at the Paris exhibition of 1878, including the series of steels varying in carbon percentages, phosphorus steels, containing 0.24 and 0.39 per cent of that element, with 0.30 carbon and 0.75 per cent manganese, and a series of manganese-iron alloys. Of these, five specimens were shown, containing from 0.45 to 0.59 per cent of carbon, about 0.03 to 0.069 per cent each of sulphur and phosphorus, and manganese varying as follows: 0.52: 1.06: 1.30: 2.00 and 2.45 per cent.

Those investigating the subject had found that, on adding 2.45 per cent of manganese, a brittle and comparatively useless product was obtained and so they did not pursue their experiments in the direction I afterwards followed, which was ultimately to result in the discovery of manganese steel.

It was as long ago as 1882 that during the course of several lengthy researches which have been described before several scientific and technical societies, my experiments led me to this discovery. In September, 1884, M. Ferdinand Gautier of the Terre Noire company wrote to me as follows:

"I thank you very much for your beautiful sample of manganese steel. After carefully examining and inspecting the fracture and other tests, I feel bound to state that this manganese steel is an entirely new kind of steel and is a new invention. Such steel has never previously been manufactured. In fact, this manganese steel could not now or previously have been made except for the introduction by myself and others of high percentages of ferromanganese containing 60 to 84 per cent of metallic manganese. These high percentages of ferromanganese have, and could only be made during the last few years."

That distinguished metallurgist, M. Alexandre Pourcel, stated in 1888 he considered the production of manganese steel the most important event in practical metallurgy during the preceding ten years. This was quite true, as my discovery and invention of manganese steel showed the important new field which was laid open.

It is instructive to note how M. Pourcel was impressed by the vital importance of manganese in the manufacture of steel, and also to trace the recognition of the need for high manganese alloys in order that manganese additions necessary at the end of the converter process should not recarburize the blown metal, when mild steel is required. While alloys with 6 per cent of carbon and 60 to 70 per cent of manganese had been prepared by melting in crucibles, it was M. Pourcel's special achievement to produce these and even richer alloys in the blast furnace and thus render their use a commercial possibility.

It was not until 1878 that the Terre Noire company was able to obtain supplies of manganese ore with more than 45 per cent of manganese. In August 1877, nevertheless there was produced from ore containing only 41 per cent, a ferromanganese with 81 per cent of manganese the coke consumption being 3 metric tons per ton. From 1878 ores containing 50 per cent and upwards were procurable and ferromanganese with 82 per cent of manganese thereafter was made regularly. The cost price had fallen from 2000 francs per ton for the crucible-made product and 1400 francs per ton for the product of the henderson furnace process to 400 francs per ton.

M. Pourcel further established the fact that in making steel in the open-hearth furnace the addition of silicon, in the form of iron silicide, completely prevented the formation of blowholes, and later on furnished the explanation of the fact, which is now generally accepted. His distinguished metallurgical reputation has been widely recognized, and in 1909 the Iron and Steel institute awarded him the Bessemer gold medal, and in 1918 elected him as honorary vice president.

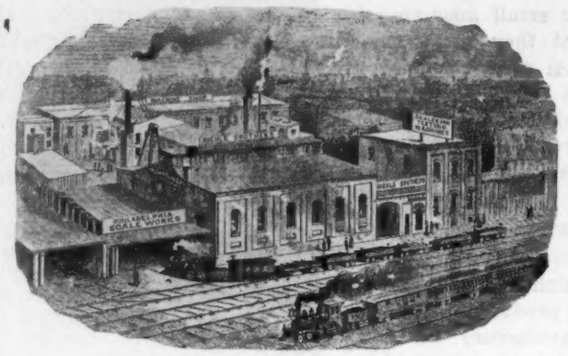
It is with particular pleasure that I look back on the long and continuous correspondence that I enjoyed with that eminent French metallurgist, the late M. Floris Osmond, who described himself as ingénieur metallurgiste. His letter to me of Oct. 2, 1889, proved the starting point of an exchange of views on metallurgical matters over a period of 23 years, in which M. Osmond never failed to communicate something of the greatest value towards the researches in which we were both so keenly interested.

To Osmond's early work the science of metallurgy owes an undying debt of gratitude. At a time when the methods of investigation employed in metallurgy were mainly chemical, Osmond, by the application of physical methods, provided the means of attaining a new order of knowledge. The beauty and exactitude of his own measurements, and observations relating to the thermal transformation and the microstructure of metals and alloys, provided a large volume of accurate fundamental data and constituted a model of metallographic research of the highest value. M. Osmond received the Bessemer gold medal of the Iron and Steel institute in 1906.

(This is an abstract of the third part of the paper by Sir Robert Hadfield, British metallurgist, read before the French Congress of Chemical Industry, in Paris, Oct. 5, 1925. Part I and II were published in the issues of Nov. 26 and Dec. 3, respectively. In this part, Sir Robert further describes his association with French metallurgists, leading up to the time when he discovered in 1882 the method of making manganese steel. It was in 1878, when he was 19, that a pamphlet published by a French firm led Sir Robert to direct his thought to study of alloys. In the next and concluding part, he presents some valuable data on the properties of manganese steel.—EDITOR.)

Lawsuit Leads to Design of First Testing Machine in 1866

By F. G. Tatnall



The Reihle plant in 1876

IN 1866, Riehle Bros., Philadelphia, were busy building platform scales, so busy as to be quite detached from interest in anything else. Platform scales were comparatively new and great developments and innovations were being made in the line. Cattle scales, hay scales, railroad track scales, furnace charging scales and the like were creating wide interest, that is, as wide as any interest could be created in 1866. American genius was just then coming into commercial prominence and a new alertness was in evidence despite the extreme conservativeness of industrial leaders. The scale business apparently was on the upgrade.

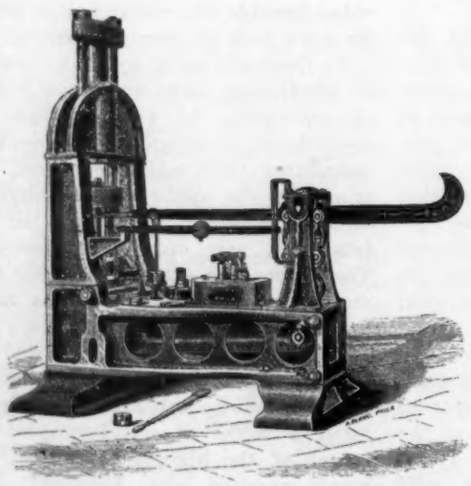
Late in 1866, a Mr. Fulton of S. Fulton & Co., manufacturers of cast iron pipe in Conshohocken, Pa., appeared in the Riehle Bros. office visibly agitated. Every one stopped to listen while Mr. Fulton unfolded the story of how he was supplying large quantities of cast iron pipe for a contractor doing work for the city of Boston. Many of the lengths of pipe already furnished had broken in transit, in handling, or after short use. As a result the city of Boston was withholding a large sum of money claiming inferior quality, consequently Mr. Fulton and the contractor were jointly suing the city. Thus far the testimony consisting of expert opinions had been extremely confusing.

Mr. Fulton concluded his story by insisting that Mr. Riehle turn aside from his scales for the moment and figure out something to test iron—some method that would be of more value than the opinions of experts. Fulton himself had no idea as to how to make the test or what to test for; he just had the idea of a test. Why Fulton chose Riehle for this enigma has never been recorded. The scale manufacturer was reluctant to be interrupted but either the appealing interest in the story or the money involved in the litigation was so great that before he knew it, Mr. Riehle and his designers were sketching out some ideas that had taken shape. But at best, the plans were vague.

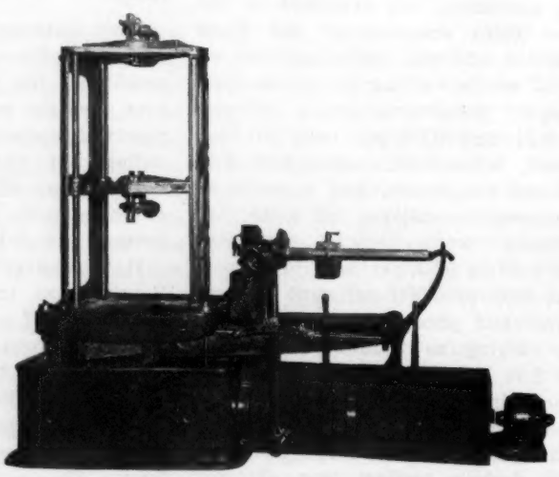
Before long Mr. Fulton reappeared bringing with him specimens of his pig iron. The scale business was now thoroughly sidetracked and all the genius of the Riehle establishment was casting about for a method to break the iron and thereby to determine strength and quality. In a few weeks a cumbersome piece of apparatus consisting of uprights and crosspieces of timber took shape. Upon one crosspiece was fixed a hydraulic jack from which was suspended a curious device known as the Riehle-type crane scale beam. A stirrup on the beam held steel clamps for gripping the upper end of the iron specimen. The lower end of the specimen pig was held in steel jaws fixed in the bottom crosspiece. On one of the timber uprights was mounted a hand pump to operate the jack. Capacity of the machine was 20,000 pounds.

While everyone looked on, the first specimen was secured top and bottom in a clumsy manner and the beam was

The author is assistant to president, Riehle Bros. Testing Machine Co., Philadelphia.



An upright testing machine of 75-ton capacity such as was used in 1874



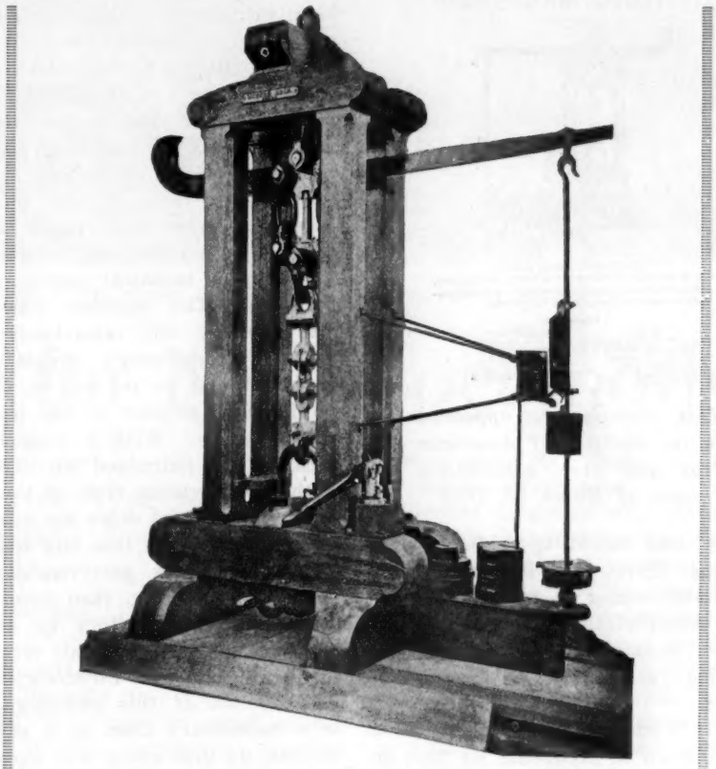
This shows a 1925 *model of the universal testing machine. It has three screws and a wide table*

balanced painstakingly. The pump raised the jack and strained the specimen while a whole crew maintained equilibrium by a hectic adding of weights and moving a poise over the beam. The specimen was in the form of a spool similar to the common wool spool of today but was very short and had a breaking area of 1 square inch. Nevertheless, the specimen actually broke and after an examination, a certificate was issued, whereupon Mr. Fulton bought the machine for $350 and Mr. Riehle went back to the building of scales.

On the strength of their visible evidences of iron quality, Mr. Fulton and the contractor won the law suit from the city of Boston and the news of the strange new testing machine traveled as rapidly as news traveled in those days. Every pipe works in the country immediately wanted a similar testing machine and Mr. Riehle had no choice but to duplicate with several improvements his first crude machine and in time every cast iron pipe works in the United States had been supplied. As the demand was being supplied, the Riehle factory began to take the testing machine end of the business seriously until it gradually came to predominate. A little later when an opportunity came to dispose of the scale business, no time was lost in completing the sale so that full time could be devoted to the manufacture of testing machines.

For many years universities had been using text books on strength of materials and standards but it was between 1880 and 1890 that they first began to buy machines and to establish their own mechanical laboratories. Riehle had a large exhibit at the Centennial Exposition in Philadelphia in 1876 which had first shown testing machines to the public in general and to the universities in particular. Experts began to come from many universities to the Riehle works to collaborate in the design of machines introducing their own improvements and many of those who designed for the company in the early days since have become authorities in their lines. John C. Trautwine Sr., author of Trautwine's Manual, told Mr. Riehle he had been testing materials on home-made apparatus all his life and when testing machine manufacture first began he brought his records in for checking.

And it was in this manner that the Riehle works became the meeting place for scientists and experts. In addition, many engineers, prefessors and business executives came to gain knowledge of the new art and among them were government officials, members of congress and representatives from foreign lands. Not all business men were pleased with the introduction of the testing machine for the term "specifications" suddenly had assumed a real meaning in contracts, especially those made with the government. Among officials visitors in the early days was Admiral Schley of the United States nevy who wanted a testing machine so special in nature that he came to the factory himself to explain its design. The machine when built was called the "Schley", following a custom of naming special machines after people or companies which ordered them.



A 40,000-pound testing machine of 1875 design. It is one of the first and is interesting because of its wooden construction

Engineers Design Own Machines

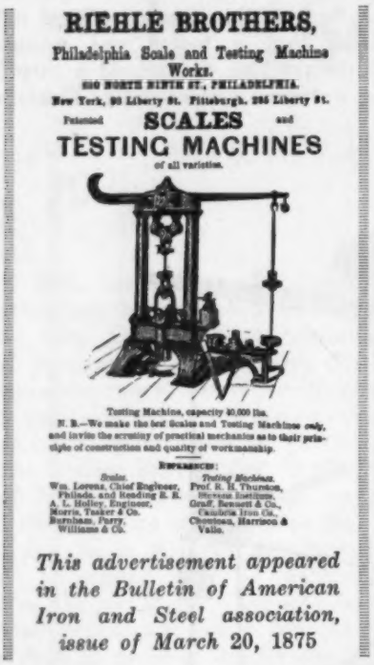
John Fritz, of Bethlehem, Pa., the first man to introduce the manufacture of steel rails in the United States, at one time sat at a big drawing board in the Riehle plant laying down the design of a machine he wanted. In these early days of testing machines it was nothing unusual to witness a conference around a drawing board where some important figure in the engineering world would be expounding his ideas of a special design. Photographs of distinguished visitors without coats and collars would make interesting material for the files.

Up to 1890 all testing machines were hand or belt driven from a line shaft. One day a customer wanted to place a machine far from any source of power and the unit was too large to operate by hand. The problem appeared to be insurmountable but as a last resort someone suggested the use of an electric motor. Because electricity at that time was not so conveniently laid out for use, this solution offered difficulties, but a motor was mounted on the machine and proved a surprising success. Consequently, Riehle at once began to advertise and build testing machines driven by an electric motor. Further developments in motor driven machines followed in rapid succession. Today the conception and working out of the electric motor as a source of power seems strange, the method having become so universal.

Creation of the American Society for Testing Materials was a great step forward in the testing field. Out of a perlexing mass of data, laws, standards, codes and theories was established a single set of proven standards. To comply with the new standards, the redesign of testing machines was necessary, but redesign must continue whenever these standards are amended.

In many other ways design was changing. Not only did greater varie-

ties of industries call for machines, but with the 20th century came the desire of engineers to test whole bridge sections, whole arches, full size columns, full length beams, whole tree trunks and the like. On the other hand, some engineers went to the other extreme in initiating diminutive tests of minute objects. As a result the



This advertisement appeared in the Bulletin of American Iron and Steel association, issue of March 20, 1875

factory was called upon to produce anything from tiny laboratory machines registering in ounces to great screw power machines larger than the largest locomotive and capable of weighing accurately to a million pounds.

By 1870 Riehle works had just about settled down to producing its first design of wooden frame testing machine when there was another disturbance. Industry now had had a few years to think about testing and to originate a few ideas. This time the interruption was caused by the supervising inspector of steam engineering of the United States who offered a contract for the building of ten boiler testing machines. It was specified, however, that the machines be of "all metal" construction.

This promised to be a serious setback but Mr. Riehle decided it could be done and proceeded to build ten all metal machines at a price of $700 each. The original design was followed as closely as possible although the weight of the units seemed hopelessly out of line. Machinery was built light in 1870. The new equipment received its share of attention and suddenly the boiler plate industry awoke as had the cast iron pipe industry three years before. Boiler plate mills began pressing for delivery of machines and among them was Carnegie Bros. & Co. Pittsburgh.

For seven years the government conducted experiments with the machines it had purchased, finally reaching the conclusion that the subject of testing had been placed on a sound basis. Consequently, in 1877 it made a compulsory ruling that samples of all plate used in wrought iron boilers must be tested. Thus Mr. Riehle's vision of a commercial field for testing machines began to approach realization so designers were set to work upon designs for a universal testing machine with greater capacity and superior to the boiler plate machine. This, Mr. Riehle hoped, would appeal to the iron and steel industry which was just then feeling its new strength as a result of its amazing progress, high finance and romance.

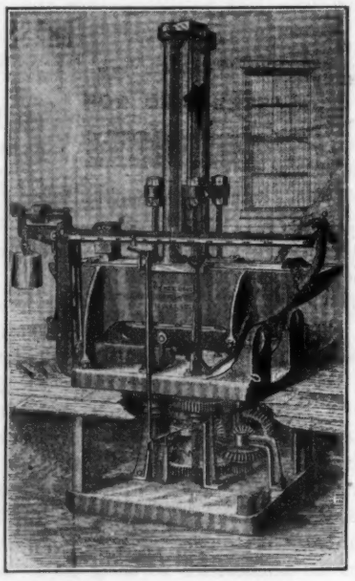
The early form of the universal testing machine was introduced in 1880 and was called the "wonder machine" by a technical publication of the time. The machine was large and unwieldy but remarkably accurate. The designer's dream began to unfold and he set out at once to sell his new product to the iron and steel industry. With a dogged thoroughness he journeyed up one bank of the Monongahela river in the Pittsburgh district and down the other visiting in turn every iron and steel mill. He repeated this performance along the Allegheny river, then covered the balance of the territory by canvassing both banks of the Ohio river from the confluence at Pittsburgh west. As a result of this campaign, more as a missionary than as a salesman, he tells us that every mill except one in that region ordered a machine.

The Pennsylvania railroad, anxious to break a trail in a new field, heard of the popularity of the machine at Pittsburgh and the growth of the testing idea, announced with little delay the establishment of a physical testing laboratory at Altoona, Pa., for the express purpose of checking up on its purchased materials. The test engineer of this laboratory shortly after reported to the company savings effected through the inspection processes. This aroused other railroads to the plan. The testing of materials idea gained ground rapidly in all lines and spurred the creation of standards. As a result testing standards sprang up from every direction.

In rapid succession industries making chain, rope, wire, fabric and cement began to demand special machines. Cement companies especially took to testing with determination. One industry followed another in the march of progress and physical testing laboratories, following the Altoona experiment sprang up at many points.

Riehle had made the first cement tests in 1867 simply as a matter of experiment and later tested cement for his own use. In 1867 the consumption of cement in the United States was only 6000 barrels, all of it being imported Portland cement. In 1922, more than 119,000,000 barrels was consumed, all manufactured in this country, and it may be said that cement testing machines had multiplied in the same proportion. Cement testing had its skeptics and local prejudice was not broken down until it was made public that during construction of the foundation for the Statute of Liberty in New York harbor 30,000 cement tensile tests were made on the new cement testing machine. The broken specimens were placed on the laboratory floor in the form of a column several feet in diameter and 10 feet high.

The variety of uses of testing machines, however, is more amazing than the variety of sizes. The Riehle company has built machines to test the adhesive power of adhesive tape; another to show the deformation of golf balls under varying driving stresses; machines to test enamel plates, the muscular reaction of a frog's leg, the strength of an entire battleship anchor



Although built in 1880, *this testing machine had a capacity of* 120,000 *pounds and operated with a screw*

chain, the strength of button holes and shoulder padding in men's clothing, and the strength of casket handles. One of the most unusual machines was one built for a circus in 1904 for the purpose of determining the tractive efforts of elephants. Another un-

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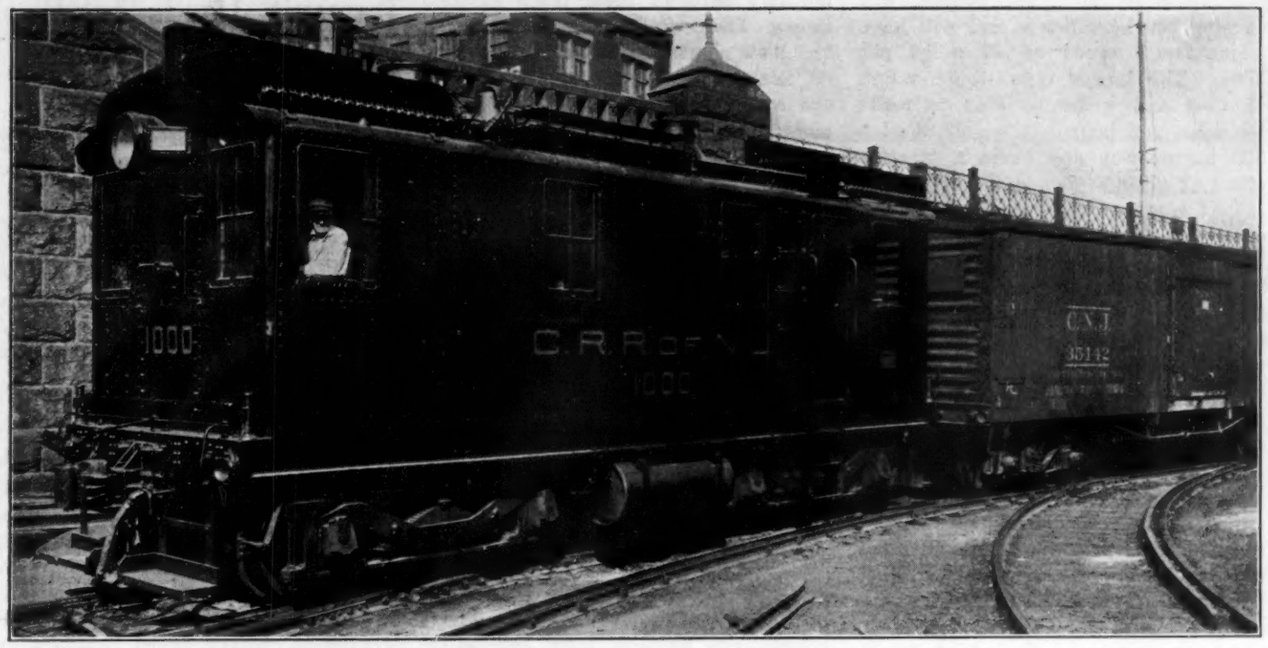


This locomotive, having all the advantages of the electric type, generates its own energy as required

See Wide Use for New Locomotive

Purchase of 60-Ton Oil-Electric Type by Eastern Railroad Solves Smoke Problem in Busy Bronx Terminal

ONE of the problems of American railroads which operate in large cities is the elimination of smoke and noise. Electrification, of course, is a solution but it is tremendously costly and requires the installation of a power system for generating and distributing energy over the right-of-way. Confronted with this problem at its Bronx terminal, New York, the Central Railroad of New Jersey has solved its problem by the purchase of an oil-electric locomotive. Advantages pointed out for this type of locomotive are: A fuel cost only one-fourth that for a steam locomotive; availability for service 24 hours a day for six days without attention; and no need for any outside source of power.

With the purchase of the 60-ton locomotive by the Central Railroad of New Jersey followed closely by the acquisition of a 100-ton type by the Long Island railroad, a new era in railroad engineering is said to have started. If the service performance of these locomotives bears out the demonstrating performances, a wide use of the oil-electric locomotive in the United States is foreseen. The locomotive, with its internal combustion engine and generator, is the product of the American Locomotive Co., General Electric Co. and Ingersoll-Rand Co.

The oil engine, which is built by the Ingersoll-Rand company, has six cylinders and is of the 4-cycle, single-acting, vertical type. Fuel oil is injected directly into each cylinder through two opposite spray nozzles placed in the combustion chamber, the fuel being delivered under pressure by a pump directly connected with the main shafting. The heat resulting from sufficient compression ignites the oil and the power stroke thus is started. The pump which injects the oil serves all six cylinders and is controlled automatically to feed each chamber as oil is needed.

For efficient action, the engine requires that the oil have a flash point of not less than 150 degrees Fahr. A forced feed system of lubrication is used and functions through a gear-driven pump in the crank case. Circulating water is distributed to all parts of the engine by a centrifugal pump attached to the crankshaft. To start the engine, compressed air at a pressure of 200 pounds is admitted successively to each cylinder through mechanically operated starting valves. That there may be a continuous supply of starting air, two small compressors are provided, one driven by an auxiliary engine and the other by the main oil engine. The latter compressor keeps the flasks of starting air continually charged.

Directly connected with the oil engine is an electric generator operating at a voltage varying between 200 and 750 volts. As the tractive motors make demands upon the generator, the output is controlled by a throttle on the oil engine. Operation of the locomotive is extremely simple, the engineer having only two control handles to manipulate. One lever serves as the throttle control of the oil engine, while the other is a master controller or electric switch which connects the tractive motors in series or parallel as conditions require. With the throttle lever set at any desired speed, the generator delivers to the four driving motors the amount of energy necessary to turn the driving wheels at the prescribed speed. Tractive effort, therefore, can be varied to suit any operating condition.

Up to the present time, oil-electric locomotives have been constructed for both slow speed switching and road service. Two slow speed types have been built weighing respectively 60 and 100 tons and capable of developing 300 and 600 horsepower. The smaller is capable of traveling 30 miles an hour and exerts a tractive effort of 36,000 pounds. The larger unit can make the same maximum speed but develops a tractive effort of 60,000 pounds. Designs have been developed for two road types. The 60-ton road locomotive will have a

tractive effort of 23,000 pounds, will develop 300 horsepower and will have a maximum speed of 45 miles per hour. The larger type would weigh 85 tons and would be able to make 55 miles per hour. It would develop 600 horsepower and exert a tractive effort of 50,000 pounds.

Performance reports disclose the operating economy of the oil-electric locomotive. The thermal efficiency based on the energy reaching the driving wheels is approximately 25 to 27 per cent. Steam locomotives show 5 to 8 per cent. The interposed system of electric drive used in this type of locomotive protects the engine from the strains and shocks which must be absorbed in a direct drive. The locomotive is enabled to run at its most efficient and economical speed with the generator providing the equivalent of countless gear changes. And last but least of the merits of the oil-electric locomotive is the manner in which the generator and driving motors automatically adjust themselves in response to the demand made upon them.

Cost of Trade Research Is Half Billion

That the industries of the United States are saved a half billion dollars annually through laboratory research work by trade associations, is the estimate made in a recent bulletin by the department of manufacture, Chamber of Commerce of the United States, Washington. The research work of some 80 national associations is summarized, showing an annual cost of approximately $35,000,000, with large sums tied up in laboratory equipment.

It is pointed out that this large sum "is not meant to imply that research is an inordinately expensive effort, but merely to indicate its importance as a trade association activity. Expenditures of individual trade organizations for research activities range from only a few hundred dollars to several hundred thousand dollars yearly."

In its survey, the department of manufacture found that the majority of trade associations spent over $20,000 each annually in research work. Referring to advantages gained from laboratory research, the department points out that definite specifications have now abolished the rule of thumb methods in industry and business. It is explained that "Heavy expense for laboratories and equipment limiting their availability to a few has been overcome largely by the co-operative movement in many lines of industry through their trade associations. These joint efforts are of an unselfish character, involving as they do the common interests of all, and are made primarily for the advancement of the industry."

Ohio Leads in Machine Tool Production

The aggregate values of the principal classes of machinery produced in the United States during 1923 far exceeded the total for 1921, according to a recent census of manufactures issued by the department of commerce, Washington, and covering machinery, machine tools, textile machinery and parts. This bulletin shows for instance, a 1923 value of $56,817,437 for metal-working machinery, three times the figure of $19,287,572 for 1921. Cranes, electrical machinery, locomotives, machine tools, ore crushers, steam shovels and wire drawing machinery also show similar increases in value.

It appears also that Ohio is easily the leading state in the machine tool industry, with a total value for 1923 of $36,423,371 as compared with $12,713,907 for Pennsylvania, closely rivaled by Massachusetts with $12,361,593 for second place. The value of machine tools for the entire country in that year was $137,206,098, of which figure 11,986 lathes worth $18,990,485 constitute the largest item. Distribution of the total valueamong the different machines is as follows:

Machine	Number	Value
Bending machines	616	$ 616,443
Boring machines	803	3,577,356
Broaching Machines	235	347,317
Cutting-off machines	951	612,340
Drillers (not portable)	8121	8,140,067
Forging machines	120	812,877
Gear cutters	1107	3,506,206
Grinders	16,780	7,781,682
Hammers (not portable)	1977	875,728
Lathes	11,986	18,990,485
Planers	302	2,110,093
Milling machines	2906	6,047,225
Pipe cutters and threaders	1958	1,002,497
Portable tools	124,420	9,312,814
Presses	12,745	6,143,820
Punching machines (not portable)	1390	1,119,302
Riveters (not portable)	1947	658,218
Screw machines, automatic	2113	4,840,739
Shapers	1569	2,052,805
Slotters	81	446,363
Shears, power	1763	980,689
Threaders, not pipe	857	1,088,910
All other machine tools	.....	22,110,484

The 350 establishments reporting in the machine tool industry employed during 1923 approximately 40,205 persons an increase of 54.8 per cent over 1921 figures. In Ohio the average number employed was 9220, far exceeding the average in any other state.

M. & V. Tank Co., Wichita Falls, Tex., has increased its capitalization from $50,000 to $150,000 to provide for building expansion.

Lawsuit Leads to First Testing Machine

(*Concluded from Page* 1468)

usual machine was built for a manufacturer of hog feeds to test thigh bones of hogs which had been given the special feed and others not.

Many interesting inquiries have been received by the company. For instance, one day a man came into the office and said "I am Mr. Dudley of the Pennsylvania railroad and I want a little machine to test steel specimens ½-inch long. Please send it down to my private car in the Philadelphia yards when completed." The request seemed amusing at first but when the gentleman explained earnestly how he was taking small specimens out of different sections of the rails all along the main lines of the road and testing them both physically and chemically, the order was taken seriously. The gentleman proved to be the late Dr. Plimmon H. Dudley, and his report formed the basis for rail specifications for the Pennsylvania railroad.

Numerous instances of a similar nature could be cited and all would support the fact that testing machines are an important factor in the well being and safety of the human race. Were it not for this positive means of determining the strength of materials, our great skyscrapers, long span bridges and extensive transportation systems never could have reached their present state of development. Consequently, there is a certain romance in reviewing the history of testing machine manufacture for it is so closely interlocked with human progress. The Riehle Bros. Testing Machine Co. this year is celebrating its one hundredth anniversary, the original company having been formed in 1825. Of the 100 years, the first 42 years were devoted to the manufacture of scales while the last 58 have been devoted exclusively to the design and construction of testing machines.

Rolls First Steel Bars in New Mill

(*Concluded from Page* 1461)

steel and glass which provide a maximum of daylight and offer excellent ventilating facilities. Much concrete is used in the mill pedestals and floor, the cement for the concrete being made in the company's cement plant at River Rouge. All of the equipment in the plant is of the latest type. When the new steel plant gets in to complete operation, the Ford company will possess one of the most modern production units in the country.

Editorials

When a "Peak" May Be a Valley

MEASURED in tonnage of iron ore shipped in 1925, the Lake Superior industry shows remarkable recovery. The total amount forwarded this year by lake and rail routes is approximately 55,480,000 tons. This is 14,000,000 tons more than the average annual shipment during the five years preceding the war. It is within 2,400,000 tons of the average for the five year period including the war time. And it is 9,000,000 tons in excess of the average in the five years following the war.

Since 1918 the industry has reported great yearly variations in shipments. These variations could be expressed as increases or decreases, from one year to another, amounting from 12,000,000 tons to 37,000,000. Averages, therefore, are important to obtain a fair estimate as to the progress of the industry. Judged by this standard alone, 1925 was a "good year" for the mine operators and owners.

Other considerations, however, are equally important. Peaks and valleys in production do not always indicate prosperity or depression in the business. While shipments in 1925 were at the peak, prices were near bottom. They were on the level with those of 1915, with major items of cost far above those of that year.

The significance of the figures is their indication of the unstabilized condition of the industry. It suffers from overproduction; and while the ability of the operators to meet increased demands is of advantage to the iron and steel industry, the resultant reaction is decidedly to their disadvantage. Steps taken to balance this condition and stabilize the ore trade ultimately would have a widespread, beneficial effect on all industries.

Merit of Service Recognized

SUSPENSION of the interstate commerce commission order requiring the pooling of privately-owned and railroad-owned freight cars marks the lifting of one more penalty on corporate size. It comes in encouraging succession to a less rampant policy by the federal trade commission, to a more benevolent interpretation of the antitrust laws by the department of justice and to a show of hostility by the American Federation of Labor toward the Sherman act.

Service invariably is the measure of a corporation. In general, the public benefits from a consolidation of buying power and the economies of mass production. In some industries, notably steel and coal, the ownership of cars has virtually become mandatory and is an expression of power conferred by merit. The commerce commission did not dissemble in originally issuing its order; it aimed to equalize competition by terminating the advantages of privately-owned rolling stock.

It would have been just as fair and logical for a court to decree that a large retail seller of coal would have to share its delivery system with a small competitor. Or that a small producer of finished steel could compel a large producer to roll tonnage it had booked but could not deliver. The real remedy lies in service which, if persisted in, will ultimately create the size which brings advantages.

Blast Furnace Index Rising

AS THE percentage of blast furnace activity draws nearer to its normal line its movements are being watched with unusual interest by many observers in the financial world. According to the now famous theory of Col. L. P. Ayres of the Cleveland Trust Co., the approach of furnace activity to normal hoists a warning flag of holders of securities which have been advancing. When the Blast Furnace Index crosses the normal line of 60 per cent, going up, the zero hour for the bull market is struck, this theory would indicate.

Blast furnace activity, as depicted by the graphs in the Business Trend, has been marching upward since August. In October it had climbed to 54.1 per cent of the total number of furnaces in the country. At the close of November there were 220 furnaces making pig iron which was 57.2 per cent of the total of 385. The index, therefore, is getting interestingly close to its normal point of 60 per cent.

Col. Ayres' theory is based upon the fundamental fact that pig iron production and the iron and steel industry are of such basic character as to mirror general industrial conditions at any given time. When industry is relaxed, as last summer, banking credit is usually cheap and in abundant supply—a made-to-order situation for a bull market in stocks. As industry gets into a swifter pace the demand for commercial credit expands, interest rates rise and money tends to

become less ample for speculative purposes. In the past the arrival of blast furnace activity at a so-called normal point and a sufficient tightening of money to discourage speculation frequently have synchronized.

For some months money has been growing more rigid. All the federal reserve banks except New York have advanced their rediscount rates. Meanwhile, the bull market in stocks has continued, with some interruptions. Next month the blast furnace index may touch 60 per cent. It is possible also that the New York federal reserve rate may be advanced. These possibilities lend exceptional interest to early blast furnace developments. Whatever may happen in stock market movements it is clear no stringency of funds for business needs impends. It is equally clear that pronounced industrial activity is assured for some months to come.

Divisional Control Helps

ONE of the impressions gained at the annual meeting of the American Society of Mechanical Engineers is that the program is improving each year through the efforts of the professional divisions. The contrast between the technical sessions of today and those held years ago before the professional divisions were organized is highly complimentary to the present arrangement.

Control of the papers and discussion by these divisions affords an opportunity for establishing a continuing policy covering a period of years. The machine shop practice group, for instance, has been able to map out a specific plan of discussion, which is followed from meeting to meeting.

This system has many advantages. In addition to making the programs more valuable, it affords another contact between the society and its members—an important consideration in an organization of the size of the American Society of Mechanical Engineers.

Congress Forces Important Issues

WITH the dropping of the gavels in both houses of congress Monday, the opening salvo of the 1926 congressional campaign actually was started, for upon the records of the two majority parties in the sixty-ninth congress, the candidates for places in the entire house and 33 seats in the senate must stand. And the national legislators have found in the past that the halls and committee rooms of congress are a forum from which to launch a campaign.

Plenty of verbal red fire will feature the session, as the Democrats will lose no opportunity to discredit not only the Republican control of congress but the Republican executive administration in the past year.

The complexion of congress in the last two years of President Coolidge's present term will hinge altogether on what the administration forces are able to accomplish. The administration naturally must be on the defensive. Many of the party wheel horses will be up for re-election next November. The Democrats have only seven candidates coming up for re-election in the senate, and all of these contests are to be in solid Democratic states of the South.

One point that is satisfactory to industry and business of the country is that no party can bury the pressing issues of taxation, shipping matters, waterway development, and the coal industry. These issues and a number of other important ones touch too many nerves of the populace. The country may well expect that principles shall be translated into action, regardless of political fence-building.

What Our Readers Are Thinking

Expresses Principles of Economics

AFTER a long search through history to find in the writings of great men the best phrasing of eight such principles, John J. Mitchell, president, Illinois Merchants bank, Chicago, and Stanley Field, chairman of the building committee for the new $12,000,000 banking edifice just completed in Chicago, have made their choice.

In letters of gold, large enough to be read from the floor of the new bank 60 feet below, these sentences will speak to generations of American business men and women:

All the progress of men and nations is based upon sacredness of contracts.—*C. W. Barron.*

A fertile soil with industry, and easy transportation for men and things from place to place, make a nation strong and great.—*Bacon.*

Human wants can be satisfied only by goods abundant and cheap, and these can be made with high wages for efficient production.—*Leverhulme.*

In the family, as in the state, the best source of wealth is economy.—*Cicero.*

Capital is what you and I have saved out of yesterday's wages.—*Hartley Withers.*

The wealth of a nation is not in prices, but in production and reserves in store and service.—*C. W. Barron.*

America has a system of banking which surpasses in strength and in excellence any other banking system in the world.—*Sir Edward H. Holden.*

Private credit is wealth, public honor is security.—*Letters of Junius.*

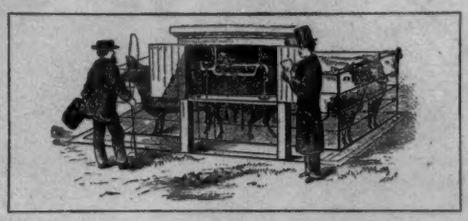
GEORGE T. TRUNDLE JR.,
Geo. T. Trundle Engineering Co., Cleveland.

The Reader's Page

Vol. LXXVII, No. 24 IRON TRADE REVIEW Dec. 10, 1925

How Testing Machines Have Been Developed

TESTING the strength of battleship anchor chain, or the muscular reaction of a frog's leg; the strength of steel rails or the "stick" of adhesive tape, all bring to the manufacturer of testing machines a remarkable diversity of problems. One day he may be called on to devise means for testing the tractive power of elephants or the strength of buttonholes, and the next, to test handles of caskets, or the thigh bones of pigs fed on a certain kind of prepared food. The variety is endless; but what is of special interest here is the origin and development of testing machines in the iron and steel industry. A Boston scalemaker was called on in 1866 to devise means for testing cast iron pipe which the city of Boston was rejecting, and this led to invention of an important apparatus. The evolution of testing machines is described on page 1466 of this issue.



From Cattle Scales to Testing Machines. Page 1466.

Contents

SPECIAL ARTICLES

Making High Grade Steel—I ..... *By John R. Coyle* 1457
Ford Rolls First Steel on New 14-inch Mill 1461
Large Uses of Steel—Buttons 1462
Designs Tilting and Revolving Spout..... 1463
Words, Study; Then Manganese Steel 1464
Lawsuit Leads to Design of First Testing Machine ..... *By Francis G. Tatnall* 1466
Editorials 1471

GENERAL NEWS

Ingot Output Near Record 1495
House Takes Up Tax Problems 1496
A.S.M.E. Program Diversified 1497
Pure Science Needs Greater Support 1498
Power Show Largest Ever Held 1501
Industrial Men in the Day's News—*William H. Woodin* 1504
Workers' Status Best in History 1507
Federation of Labor Promises Co-Operation 1508
Foreign Trade Bureau Broadens 1513
Mill Scrap Specification Proposed 1514

Men of Industry 1505
Obituary 1509
Here and There in Industry 1511
Business Changes .. 1516
Statistics of Industry 1515
Construction and Enterprise 1517
New Trade Pubs. 1519

MARKET REPORTS

Review of Markets ..... *By C. J. Stark* 1478
Iron and Steel Prices 1479, 1480, 1484, 1512, 1522

Pig Iron 1481
Coke 1482
Ferroalloys 1482
Semifinished 1483
Plates 1483
Iron and Steel Scrap 1485
Sheets 1485
Tin Plate 1486
Strip Steel 1486
Pipe 1486
Nuts, Bolts, Rivets.. 1486
Bars 1487
Cold Finished Steel 1487
Hoops and Bands 1487
Structural Shapes .. 1488
Reinforcing Bars 1489
Railroad Equipment 1490
Wire and Nails 1490
Nonferrous Metals .. 1491
Coke By-Products.... 1491
Pacific Coast Markets 1492
Foreign Markets 1493
Machinery Markets.. 1494
Crane Inquiry and Awards 1494
Warehouse 1512

BUSINESS TREND

Blast Furnace Dial Mirrors Good Business ..... *By John W. Hill* 1474

Blast Furnace Dial.. 1474
Pig Iron Production 1475
Blast Furnace Index 1475
Freight Car Awards 1476
Mail Order Sales .. 1476
Coal Situation 1477
Employment Index.. 1477

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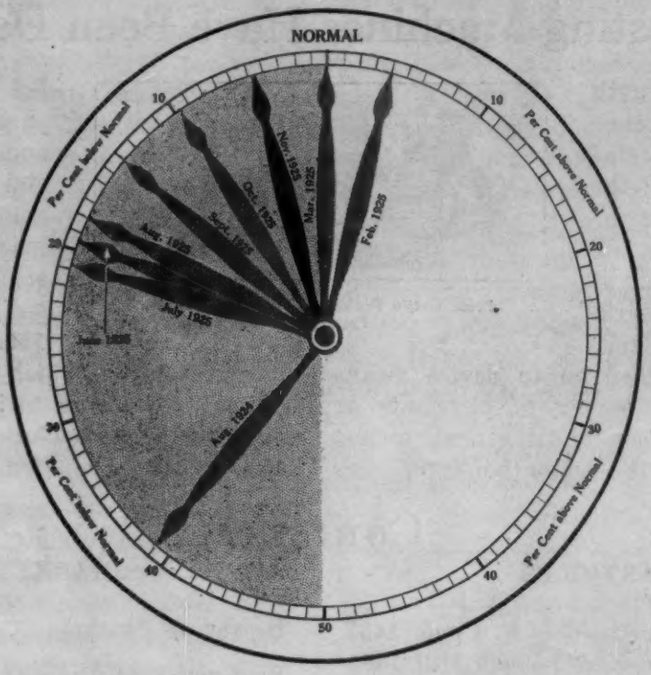
The Business Trend

Blast Furnace

The Dial represents the Blast Furnace Index of Business which is based upon a 40-year record of furnace activity. It is a barometer of general trade.



Business Dial

When 60 per cent of all the country's furnaces are in blast business conditions are normal. The Index is now lower than the normal point on the dial.

Blast Furnace Dial Mirrors Good Business

By JOHN W. HILL, Financial Editor

WITH the heavy shaded hand of the Blast Furnace Business Dial drawing near its normal point, there is pictured a truly active and prosperous condition for general industry. At the close of November 220 furnaces were in blast. This was 57.2 per cent of the total number of 385, compared with 54.1 per cent one month before and the theoretical normal of 60 per cent.

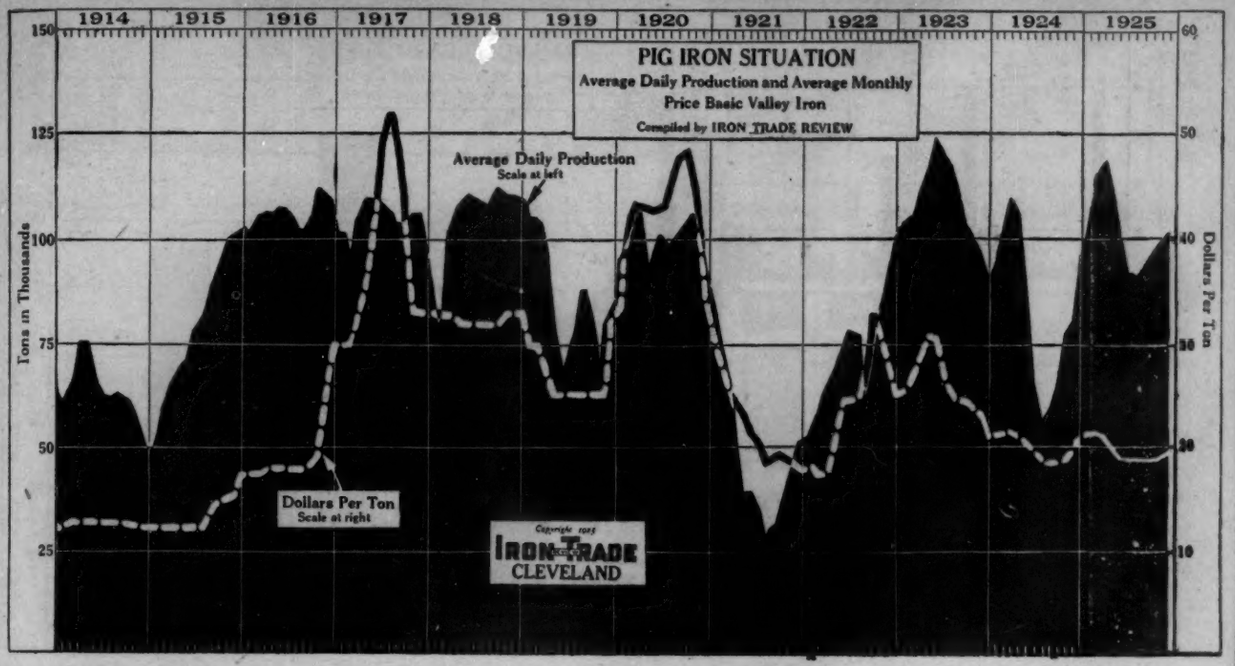
THE business pulse is strong but there is no evidence of dangerous high blood pressure. The Blast Furnace Dial has advanced by easy stages from 21 per cent below normal last summer to less than 5 per cent below normal on Nov. 30. Industry clearly has not indulged in a spectacular surge of overproduction.

THIS fact is one of the basic sources of strength in the present situation. In the iron and steel industry outputs have followed closely in the wake of demand this year. The great scale of requirements is indicated by the prospect of a new high annual record for steel ingot production, while pig iron will fall short by a relatively slight margin of the best previous year.

MANY other industries will make new high records also, including those of automobile and building. So far the expected seasonal reduction in activities in these lines has touched them very lightly. November automobile output scored a new peak for the month. It is reported that some producers, having curtailed production, soon are to step it up again in response to unusual winter demand.

GOOD business is being reflected in industrial profit and loss accounts. The year promises to witness the best net earnings by business in half a decade. Earnings of many companies are pronounced compared with 1924. It is noteworthy that because of low prices, improvement in the earnings of iron and steel companies has been smaller than most others.

BETTER profits and prospects for continued improvement, coupled with easy money, have lifted security prices to high ground. The Blast Furnace index, in approaching its normal of 60 per cent may mean that the tops of share values are near. In the past, when the normal line was crossed, the event frequently has foretold the end of an advance in stocks.

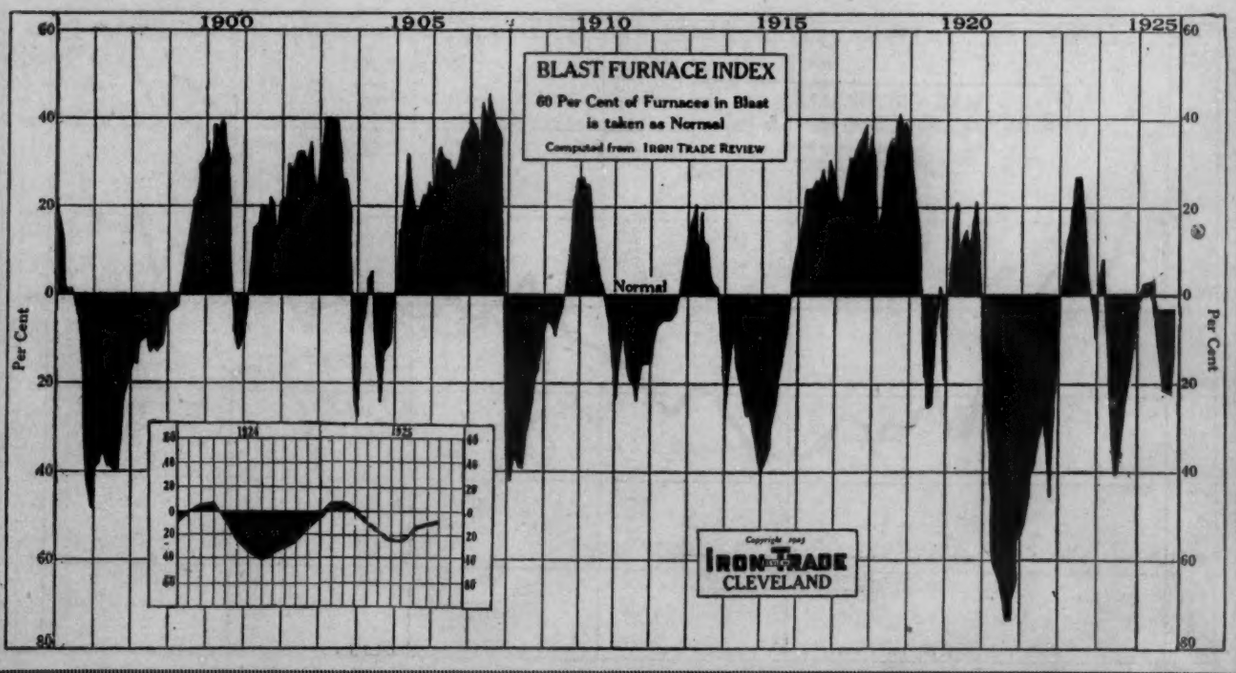


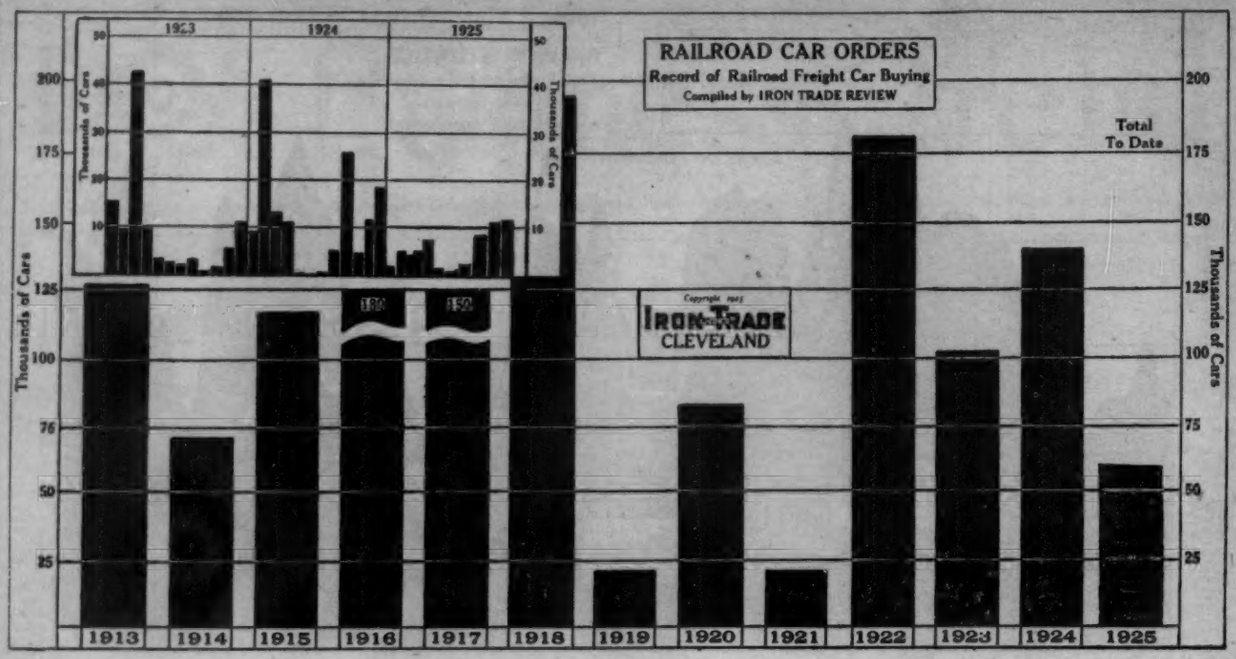
Pig Iron Production

PIG iron production in November climbed to a daily average of 100,621 tons compared with 97,351 tons in October and 83,832 tons in November, 1924. The rate for the month was the best level reached since April. The moderate gain over October due to the fact that the increase in furnaces in blast came during the last half of the month. Pig iron demand remains strong and prices are firm. Basic valley iron in November averaged $19.85 a ton against $18.70 a ton in October.

Blast Furnace Index

NOVEMBER brought an increase of 11 in the number of active blast furnaces. The active list at the close of the month was 220 against 209 one month before. This was 57.2 per cent of the total number of 385 furnaces now available. One month before, the percentage was 54.1 per cent. The Blast Furnace Index, therefore, stands 4.6 per cent below the so-called normal point. A gain of 11 additional furnaces, which is possible in December, will bring the index even with normal.



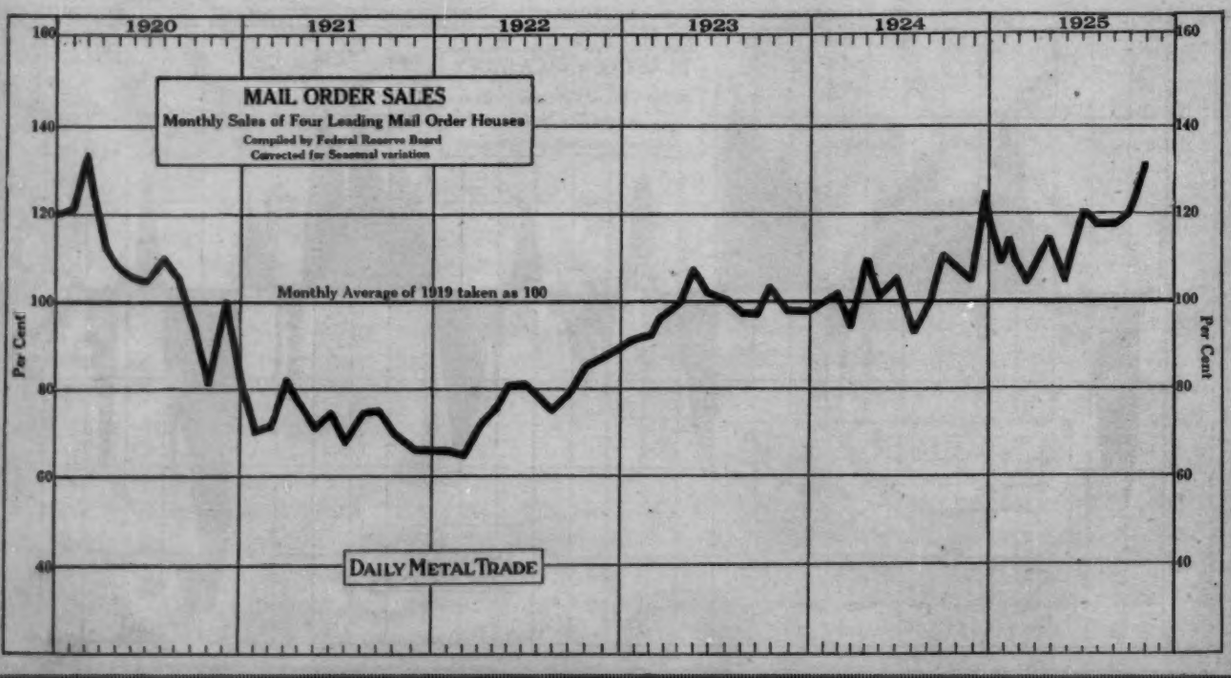


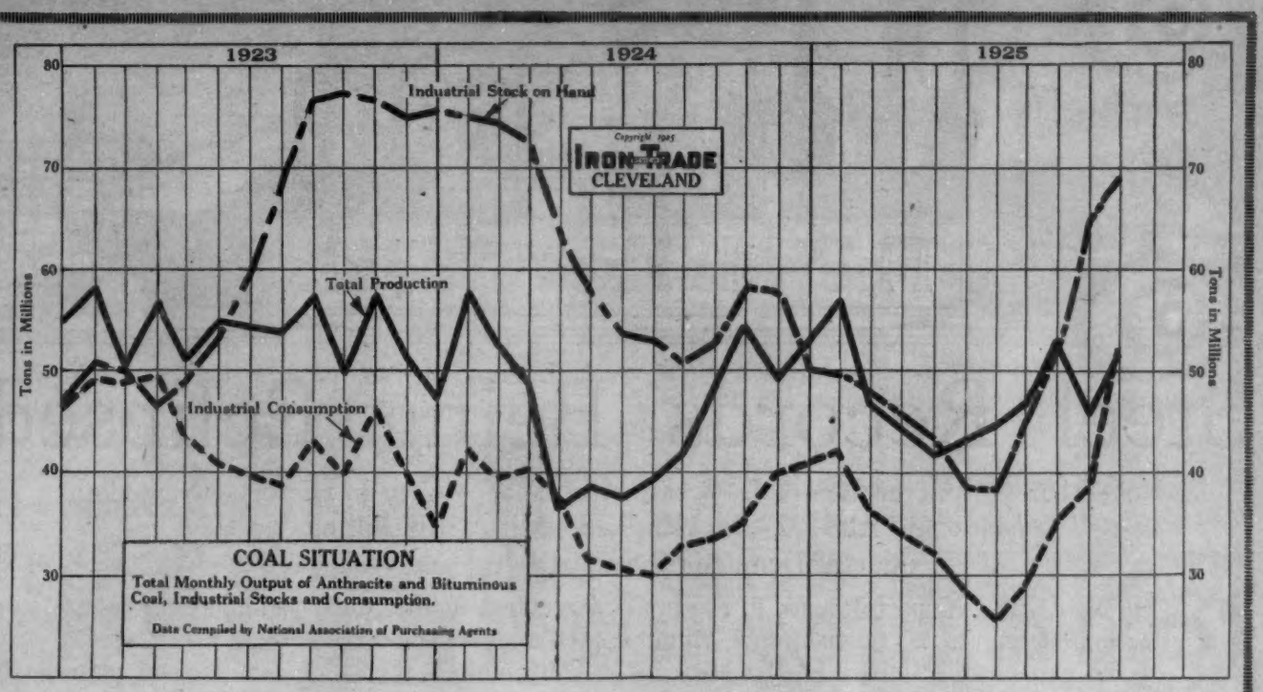
Railroad Car Orders

RAILROAD buying gradually is taking on momentum. During November the number of new cars purchased was 11,685 against 11,145 in October. These months show a substantial increase compared with the monthly average awards of 4150 during the first nine months of 1925. For the year to the close of November the roads ordered 60,226 new freight cars. This compares with 126,-101 cars ordered during the corresponding period last year. With traffic and earnings without precedent, all signs point toward further large railroad buying.

Mail Order Sales

RECORDS of retail trade in all of its phases this year have emphasized the extraordinary purchasing power of the consuming public. Mail order sales have made it clear that the farm population is not lagging in the matter of satisfying its wants. During November sales of leading mail order houses gained from 10 per cent to 15 per cent over one year before. In October the mail order index, compiled by the federal reserve board, shows an increase of 10 per cent over September and of 20 per cent over October, 1924.



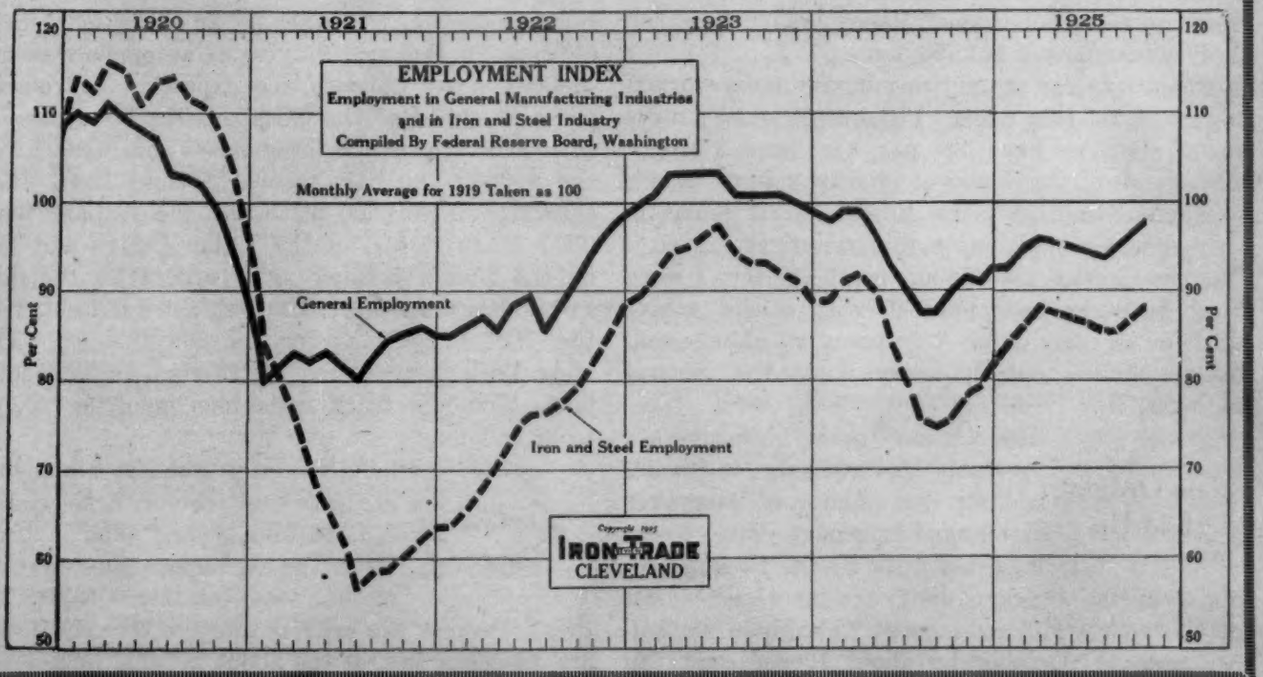


Coal Situation

INDUSTRIAL activity touched a high level in October according to the figures of coal consumption compiled by the National Association of Purchasing Agents. The month brought an increase in consumption of 26 per cent to the highest point since the spring of 1923. At the same time production increased only 12.7 per cent although outputs of soft coal now is the highest in five October rate of use, against 50 days supply years. Stocks on Nov. 1 amounted to 67,837,000 tons or enough to last 39 days at the one month before.

Employment Index

SOME light upon the unmatched purchasing power and consumption of the public this year is shed by the data of employment. According to the index computed by the federal reserve board, employment in manufacturing industries stood at 97 per cent of the 1919 level in October. This was the highest point attained since last April. Iron and steel employment has increased also. The index stood at 88.4 per cent of the 1919 average in October against 87.7 per cent one month before and 82.1 per cent one year ago.



Steel Records Being Eclipsed

November Output of Ingots Is Greatest for That Month in History—New High Mark for All 1925 Is Promised—Mills Still Filling Up as General Demands Continue Large and Active

RECORD-BREAKING performance in the production of ingots is furnishing a climax to the expanded activities of the steel industry as the final periods of the year are being traversed. November's output of steel ingots was the largest in history for that month and December has started off in a way that indicates a similar mark will be established. If December maintains this momentum or shows even a moderate slowing down which would be unexpected, the highest yearly production of steel ingots in history is assured for 1925 or close to 44,000,000 tons.

In November the country was making steel ingots at the rate of 48,600,000 tons annually, which compares with a rate of 44,840,000 tons in October or a gain of 8.4 per cent. On a daily basis, the past month averaged 156,294 tons which represented 96.7 per cent of the highest monthly mark on record or that of March 1924. Then the daily average was 161,796 tons.

Operations for the entire industry have worked higher again this week. Pittsburgh and Youngstown districts have 88 per cent and Chicago 86 per cent of steelworks equipment active, though the actual tonnage being turned out is considerably more, proportionate to theoretical capacity. Eastern works are doing much better. More blast furnaces have gone in with others scheduled for an early date. A dropping off of tube mill output stands out by contrast to the general increase.

New Orders Hold Up

Reports on new business are favorable. Emphasis is being laid on the amount of carryover of tonnage into next year. Bookings last week by the leading producer in the Chicago district were the heaviest of the year. Mill tonnage at Chicago in November exceeded October by about 15 per cent. In a number of lines, mill bookings still outrun shipments.

The limited supply of semifinished material on the market is apparent. Spot tonnage is almost unobtainable. Mahoning valley makers are sold up on all forms for the first quarter. A Cleveland maker is quoting $38.

Stocks Are Reduced

Furnaces are reducing pig iron stocks because of the heavy needs consumers are bringing to them constantly. Some producers shipped more iron in November than in any previous like period, one, by 10,000 tons. Buying is small though in the Philadelphia district 40,000 tons of basic was closed. Virginia iron has been advanced $1.

Automobile builders, manifestly are preparing for heavy operations ahead though they are carrying on remarkably well for the season. The Ford Motor Co. will start on an increased schedule early in January. Buying of automobile sheets indicate some builders are expecting to run 50 per cent ahead of the early months last year.

Award of over 125 locomotives this week gives the market the best record in some time. Car orders embrace 2000 placed by the Wabash with 2000 inquired for by the Union Pacific and 500 by the Mobile & Ohio. Car orders for the first 11 months totaled 60,225. Rail news is light with the Nickel Plate closing on 20,000 tons. The New York Central has distributed an unusually large order for track fastenings involving 20,000 to 30,000 tons.

Ore Gain Large

Lake Superior iron ore shipments in 1925 now complete were 11,654,186 tons greater than in 1924. With the movement by rail estimated, they totaled 55,549,296 tons. Despite the heavier tonnage brought down, ore on docks Dec. 1 was about 200,000 tons below

one year ago and totaled 7,856,154 tons.

Winding up the largest year in history, structural steel demands for buildings have been exceptionally good this week, totaling 38,811 tons.

Of the Detroit inquiry for cast iron pipe, the award of 8000 tons to French and 9000 tons to American shops has been recommended. There is talk that Fort Worth, Tex., may buy 12,000 tons of foreign pipe.

An easing of mill pipe prices has forced IRON TRADE REVIEW composite of fourteen leading iron and steel products slightly lower this week, after a consistent rise. The average is $39.10 compared with $39.17 last week.

Prices, Present and Past

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Dec. 9, 1925	Nov. 1925	Sept. 1925	Dec. 1924
PIG IRON				
Bessemer, valley, del., Pittsburgh	$22.76	22.61	21.01	23.51
Basic, valley	20.00	19.85	18.25	20.75
Basic, eastern del., eastern Pa.	23.00	22.70	20.50	23.25
*No. 2 foundry, del., Pittsburgh	22.26	22.11	20.51	22.61
No. 2 foundry, Chicago	23.00	22.75	21.10	22.40
*Southern, No. 2, Birmingham	21.00	17.90	18.50	19.80
*Southern Ohio, No. 2 Ironton	21.00	20.90	19.50	21.80
**No. 2X, Virginia furnace	24.00	23.00	23.00	24.50
**No. 2X, eastern, del. Phila.	24.26	24.01	21.86	24.88
Malleable, valley	20.50	20.35	18.75	21.10
Malleable, Chicago	23.00	22.75	21.10	22.40
Lake Superior charcoal, Chicago	29.04	29.04	29.04	29.04
Gray forge, val., del. Pittsburgh	21.76	21.61	19.86	22.01
Ferromanganese, del., Pittsburgh	119.79	119.79	119.79	109.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville furnace, ovens	3.50	6.35	3.45	3.70
Connellsville foundry, ovens	5.00	6.85	4.20	4.60
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	36.00	35.25	34.25	39.10
Sheet bars, open-hearth, Pittsburgh	36.00	35.25	35.00	37.75
Billets, open-hearth, Pittsburgh	35.00	35.00	35.00	35.60
Wire rods, Pittsburgh	45.00	45.50	45.00	48.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.00	2.00	1.95	2.10
Steel bars, Chicago	2.10	2.10	2.10	2.10
Steel bars, Philadelphia	2.32	2.32	2.27	2.32
Iron bars, Philadelphia	2.22	2.22	2.12	2.18
Iron bars, Chicago, mill	2.00	2.00	1.90	2.00
Beams, Pittsburgh	2.00	1.95	1.90	2.05
Beams, Philadelphia	2.17	2.17	2.17	2.32
Beams, Chicago	2.10	2.10	2.10	2.20
Tank plates, Pittsburgh	1.90	1.85	1.80	1.90
Tank plates, Philadelphia	2.07	1.92	2.07	2.22
Tank plates, Chicago	2.10	2.10	2.10	2.20
Sheets, black, No. 28, Pittsburgh	3.35	3.25	3.15	3.50
Sheets, blue anl., No. 10, Pittsburgh	2.50	2.40	2.30	2.65
Sheets, galvanized, No. 28, Pittsburgh	4.60	4.50	4.20	4.65
Sheets, black, No. 28, Chicago	3.50	3.45	3.35	3.75
Sheets, blue anl. No. 10, Chicago	2.65	2.60	2.45	2.85
Sheets, galvanized, No. 28, Chicago	4.75	4.70	4.45	4.90
Wire nails, Pittsburgh	2.65	2.65	2.65	2.80
Wire nails, Chicago	2.70	2.70	2.70	3.00
Tin plate per base box, Pittsburgh	$5.50	5.50	5.50	5.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	19.00	19.50	19.00	21.00
Heavy melting steel, eastern Pa.	17.50	17.60	17.25	20.50
Heavy melting steel, Chicago	16.00	16.40	16.45	18.65
No. 1 wrought, eastern Pa.	18.75	18.75	18.25	20.10
No. 1 wrought, Chicago	15.75	17.70	17.05	18.75
Rails for rolling, Chicago	18.75	19.40	19.00	19.90

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Dec. 9, 1925)	$39.10
Last week (Dec. 2, 1925)	$39.17
One month ago (November, 1925)	38.73
Three months ago (September, 1925)	37.35
One year ago (December, 1924)	40.21
Ten years ago (December, 1915)	31.56
Twelve years ago (December, 1913)	23.29

Late News Flashes

Merger Hearing at Baltimore Completed

Washington, Dec. 8.—Testimony of iron and steel jobbers and fabricators in the Baltimore district has been completed in the Bethlehem merger case by federal trade commission counsel. The case has been adjourned to be resumed at a later date, probably in Pittsburgh. Final testimony of the commission likely will be given in Washington.

Protest Against Government Activity

Washington, Dec. 8.—Representatives of a large number of trade associations will attend the meeting called here for Thursday and Friday to protest against government activity in competition with private industry and business, it was announced today. The meeting is expected to launch a nationwide movement against competition with industry by federal, state, county and city governments.

Carnegie Dismantles Another Stack

Pittsburgh, Dec. 8.—Dismantling of the Riverside blast furnace of the Carnegie Steel Co., at Steubenville, O., was started on Dec. 1. Steel in the building and machinery will be cut up for scrap and shipped to the Mingo works. The plant consists of one blast furnace of 14,000 tons annual output, three stoves, a pig casting machine and other machinery, and has been idle since Jan. 27, 1919. No immediate disposal of the site is indicated.

Three More Furnaces Resume

Pittsburgh, Dec. 8.—The Carnegie Steel Co. has blown in the third of its Isabella blast furnaces and also a third stack at its New Castle plant, making 36 stacks active out of a possible 53, the latter total having been reduced one by the dismantling of the Steubenville stack. The Bethlehem Steel Corp. this week blew in another furnace at Lackawanna, making five stacks active there. Steelmaking in Pittsburgh territory is approximately on an 88 per cent basis.

Some Equipment Undergoes Repairs

Youngstown, O., Dec. 8.—Steelworks operation throghout the Mahoning valley is at 88 per cent compared with 93 per cent a week ago. Idle openhearth equipment is undergoing repair. Sheet mill schedules are sustained at 95 per cent. Bar mill operations are at 85 per cent or 5 per cent lower than last week. The Youngstown Sheet & Tube Co. will blow in one of its Hubbard, O., stacks Jan. 1. Of the 42 stacks in the Mahoning and Shenango valleys 26 are active.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Philadelphia	40.30 to 41.30
Chicago	35.00
Forging, Pittsburgh	40.00 to 41.00
Forging, Philadelphia	45.30 to 46.30

SHEET BARS

Pittsburgh	$36.00
Youngstown	36.00

SLABS

Pittsburgh	$35.00
Youngstown	35.00

WIRE RODS

¼-inch and finer

Pittsburgh	$45.00 to 46.00
Cleveland	45.00 to 46.00
Chicago	47.00

Standard extras, $2.50 per ton over ⅝-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	1.90c
Universal skelp, Pittsburgh	1.90c
Sheared skelp, Pittsburgh	1.90c

Structural Shapes

Pittsburgh	1.90c to 2.00c
Philadelphia	1.98c to 2.32c
New York	2.14c to 2.34c
Chicago	2.10c
Cleveland	2.09c to 2.19c
Birmingham	2.05c to 2.15c

Steel Plates

Pittsburgh	1.90c to 2.00c
Philadelphia	2.02c to 2.12c
New York	2.04c to 2.14c
Chicago	2.10c
Cleveland	1.99c to 2.09c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.00c to 2.10c
Pittsburgh, cold finishing	2.15c to 2.25c
Pittsburgh, forging quality	2.15c to 2.25c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
Cleveland, soft steel	2.19c
Birmingham, soft steel	2.15c to 2.25c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	3.00c to 4.50c
Pittsburgh, reinforcing billet	2.00c to 2.10c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	2.00c to 2.10c
Mill, rail steel	1.80c to 1.90c
Philadelphia, common iron	2.17c to 2.22c
New York, common iron	2.19c to 2.24c
Chicago, common iron	2.00c

Hoops, Bands, Strips

Hoops, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh over 6 in.	2.30c
Hot rolled strip steel, Pittsburgh stamping quality	2.30c to 2.50c
Hot rolled strip steel, Chicago	2.50c to 2.60c
Bands, Chicago, under 6 inches	2.60c
Bands, Chicago, 6 in. and over	2.50c
Cold rolled strip steel, hard coils, 1⅛ inches and wider by 0.100-inch and heavier, base, Pittsburgh, Cleveland	3.90c
Worcester, Mass., Chicago	4.05c to 4.15c

Cold Finished Steel

Cold finished steel bars, drawn, or rolled Pittsburgh, Chicago carloads	2.50c
Less carload	2.75c
Steel shafting turned and polished Pittsburgh, Chicago	2.60c

Screw stock base Cleveland $1 higher; and Worcester $8 higher than Pittsburgh and Chicago.

Hot Rolled Alloy Steel

Pittsburgh or Chicago

S. A. E. Series—

2300 (3½ per cent nickel)	4.60c to 4.75c
3100 (Nickel chromium)	3.60c to 3.65c
6100 (Chrome vanadium)	4.40c to 4.50c
6100 (Chrome vanad. spring)	3.85c to 4.00c
9255 (Silico-mang. spring)	3.30c to 3.40c

Billets—4 x 4 to 10 x 10, gross ton at net ton bar prices; under 4 x 4 to 2½ x 2½-inch $5 higher. Chicago base $2 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open- h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relaying rails, Pittsburgh	27.00 to 30.00
Light rails, 25 to 45 mill g.t.	36.00 to 38.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.90c to 3.00c
Spikes, boat and barge, Pitts.	3.25c
Spikes, railroad, Chicago	2.90c to 3.00c
Track bolts, Pitts. standard	3.90c to 4.15c
Track bolts, Chicago	3.90c to 4.15c
Tie plates, Pittsburgh	2.35c
Tie plates, Chicago	2.35c

Wire Products

To Jobbers in Carloads

F.o.b. Cleveland and Pittsburgh	base
Wire nails	2.65c
Galv'd nails smaller than 1-inch	4.90c
Galv'd nails, 1-inch and over	4.65c
Plain wire	2.50c
Annealed wire	2.65c
Galvanized wire No. 9 gage	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
Polished staples	3.10c
Galvanized staples	3.35c
Coated nails, count keg	1.85c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.63

Joliet, DeKalb and Waukegan, Ill., and Anderson, Ind., prices $1 per ton over Cleveland-Pittsburgh base on products made there; Chicago $1 higher; Duluth $2 higher and Worcester, Mass., and Fairfield, Ala., $3 higher.

Sheets

SHEET MILL BLACK

No. 28, Pittsburgh base	3.35c
No. 28, Philadelphia, delivered	3.67c
No. 28, Gary, Indiana Harbor	3.45c
No. 28, Chicago, delivered	3.50c

TIN MILL, BLACK

No. 28, Pittsburgh	3.35c
No. 28, Gary base	3.45c

GALVANIZED

No. 28, Pittsburgh base	4.60c
No. 28, Philadelphia, delivered	4.92c
No. 28, Gary, Indiana Harbor	4.70c
No. 28, Chicago, delivered	4.75c

BLUE ANNEALED

No. 10, Pittsburgh base	2.50c
No. 10, Philadelphia, delivered	2.82c
No. 10, Gary, Indiana Harbor	2.60c
No. 10, Chicago, delivered	2.65c

AUTOMOBILE SHEETS

No. 22, Pittsburgh base	4.50c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

Tin plate, coke base	$5.50

Gary, Ind. base 10 cents higher.

Long ternes, base	4.85

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less and $4 per ton higher. Chicago delivered 2½ points less and $5 per ton higher.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 2¼ to 3¾-inch	32½
Charcoal iron, 2¼ to 4½-inch	5
Seamless hot rolled, 2¼ to 3½-inch	46 off

Chain, Piling, Cut Nails

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c to 2.30c
Cut nails, c. l., f.o.b. mills	2.80c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$54.20
Six-inch and over, Chicago	50.20
Four-inch, Birmingham	46.00 to 47.00
Six-inch and over, Birmingham	42.00 to 43.00
Four-inch, New York	56.50 to 57.60
Six-inch and over, New York	51.50 to 52.60

Standard fittings, Birmingham base $110.00, 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B

Nuts and Bolts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Hot pressed square tapped or blank	$4.00 off list
Hot pressed hexagon tapped or blank	$4.40 off list
Cold punched square or hexagon blank	$4.10 off list
Cold punched square or hexagon tapped or blank	$4.10 off list
Cold punched U. S. S. semifinished hexagon nuts ⅝-inch and larger	75, 10 and 5 off
Cold punched U. S. S. semifinished hexagon nuts 9/16-inch and smaller	80, 10 and 5 off
Cold finished S. A. E. semifinished ⅝-inch and larger	75, 10, 10 and 5 off
Cold finished S. A. E. semifinished 9/16-inch and smaller	80, 10, 10 and 5 off

CARRIAGE BOLTS

(⅜ x 6-inch, smaller and shorter)

Rolled thread	50, 10 and 10 off
Cut thread (all sizes)	50 and 10 off
Eagle carriage bolts (Eagle list)	65 and 10 off

MACHINE BOLTS

(⅜ x 4-inch, hot pressed nuts)

Rolled thread	60 and 10 off
Cut thread (all sizes)	50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread	45, 10 and 5 off
Lag screws	60, 10 and 10 off
Plow bolts Nos. 3 and 7 heads	50 and 10 off
All other standard heads	50 and 10 off plus 20 per cent
Tap bolts	30 off
Bolt ends with hot pressed nuts	50, 10 and 10 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)	40 and 10 off
Stove bolts, 80, 10 and 5 off plus 2½ off in bulk.	
Tire bolts	60 and 5 off

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000, f.o.b. producer's plant, freight allowed

	S.A.E. Castellated	U.S.S. Slotted
¼	$ 4.40	$ 4.40
5/16	5.15	5.15
⅜	6.20	6.60
7/16	7.90	9.00
½	10.10	10.50
9/16	13.80	14.20
⅝	17.00	17.80
¾	23.50	24.00
⅞	36.00	36.00
1	55.50	58.00
1⅛	89.00	89.00
1¼	126.00	131.00
1⅜	183.50	183.50
1½	210.00	210.00

Larger sizes—Prices on application

HEXAGON CAP SCREWS

Milled	80 and 10 off
Upset	80, 10 and 10 off

SQUARE HEAD SET SCREWS

Milled	80 and 5 off
Upset	80, 10 and 5 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.60c
Structural rivets, carloads, Chicago	2.75c
**Rivets, 7/16-in. and smaller Pittsburgh, Cleveland	70 and 10 off
**Rivets, 7/16 in. and smaller Chicago	70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist.	$6.30 to 6.40 off
Wrought c.l., Pitts dist	6.25 off
Lock Washers, f.o.b. factory	35 off

Pig Iron

Shipments Continue on Heavy Basis, But New Orders Generally Are Light—Backlogs Good, Prices Firm

SALES of pig iron generally are light, one reason being the approach of inventory time. Shipments, however, continue on a high basis, most furnaces forwarding all of their present output and some continuing to reduce their stocks. In a number of instances consumers have asked to have their shipments expedited, a few of them wanting January quotas delivered this month. Good sales of foundry iron are being made at Chicago, and in eastern Pennsylvania, where more basic iron has been closed. Leading furnace interests have large backlogs for the first quarter. Southern Ohio furnaces have sold 75 to 80 per cent of their first quarter output. Prices in practically all districts are unchanged from last week.

PITTSBURGH, Dec. 8.—Shipments of pig iron continue to exceed production. Several furnaces report customers taking out January iron. Other state consumers ask for expedited deliveries of December tonnage. Prices remain firm but unchanged. No inquiries are pending for basic; a few are out for single carloads of bessemer. Foundry iron inquiries and purchases are confined to single carloads up to 200 tons. A Pittsburgh engineering works is in the market for some No. 2X. The Hyde Park Foundry & Machine Co. is understood to have closed recently with a valley steelworks interest on a reciprocal basis. A report originating in the valley is current here that the Sharon Steel Hoop Co. is negotiating to lease the Struthers furnace, which if successfully concluded will make the Sharon company a seller instead of buyer of iron.

Boston, Dec. 8.—While pig iron buying for first quarter has subsided, some spot demand has appeared. Prices are uncertain, but firmer in some cases. A sale of 200 tons of No. 2X is reported at $22, Buffalo furnace, or $26.91 delivered. Continental iron holds at $22, f.o.b. cars, Boston.

Philadelphia, Dec. 8.—Fully 40,000 tons of basic iron for first quarter was sold in the past week at unchanged prices. Foundry sales aggregated over 10,000 tons. Although quiet, buying by pipemakers may have greatly swelled this total. Foundry iron continues quotable at $23, base eastern Pennsylvania furnace. Moderate sales of copper-bearing, low phosphorous iron are noted, mostly at $25, furnace. Virginia foundry has been advanced to $24 base, furnace, plus 50-cent silicon differentials. English low phosphorus iron has been offered at $24 delivered in this territory.

Buffalo, Dec. 8.—New demand for pig iron is small, inquiry being under 5000 tons. It is believed foundry consumption is increasing as December shipments have increased. Buffalo maker is trying to establish $22, base, for first quarter, but others will accept $21. The $22 fourth quarter price is largely nominal in view of the lack of demand.

Cleveland, Dec. 8.—Developments in the pig iron market during the week have been slow, and of routine character. Sales by furnace interests with headquarters here total 5000 tons, about one-fifth of what they were two weeks ago. The approach of inventory time, however, does not find much slackening in shipments, one or two requests for delays being received, as against a dozen more to expedite shipments. The leading merchant furnace company shipped in November 10,000 tons more than in any preceding month in its history. One of the Cleveland stacks that recently blew out for relining will be in operation before the close of the year. The valley price of No. 2 foundry iron is quoted at $20.50, furnace. The lake furnace price remains $23 to $23.50, while Buffalo furnaces are quoting $21 to $22, base, the latter applying on iron for prompt shipment.

Pig Iron Prices

Prices per gross ton

Bessemer, valley	$21.00
Bessemer, Pittsburgh	22.76
Basic, valley	20.00
Basic, Pittsburgh	21.76
Basic, Buffalo	20.00 to 20.50
Basic, del., eastern Pa.	22.75 to 23.75
Malleable, valley	20.50 to 21.00
Malleable, Pittsburgh	22.26 to 22.76
Malleable, del., Cleveland	22.26 to 22.76
Malleable, Chicago	23.00
Malleable, Buffalo	21.00 to 22.00
Malleable, del., eastern Pa.	24.25 to 24.75
No. 1X, eastern del., Phila.	25.26
No. 1X, Buffalo	22.50 to 23.50
No. 1 foundry, Chicago	23.50
No. 2 foundry, valley	20.50 to 21.00
No. 2 foundry, Pittsburgh	22.26 to 22.76
No. 2 foundry, Buffalo	21.00 to 22.00
No. 2 foundry, Chicago	23.00
No. 2 foundry, Granite City	23.50 to 24.00
No. 2 foundry, Ironton fur.	21.00 to 21.50
No. 2 foundry, del., Cleveland	22.26 to 22.76
No. 2 foundry, del., Phila.	23.76 to 24.76
No. 2 foundry, N. J., tidewater	24.39 to 24.76
No. 2X, eastern del., Phila.	24.26 to 25.13
No. 2X, east. N. J., tidewater	24.89 to 25.76
No. 2X, eastern del., Boston	26.65 to 27.65
No. 2X, foundry, Buffalo furnace	21.50 to 22.50
No. 2X, Buffalo, del., Boston	26.91 to 27.41
Continental foundry f.o.b. Boston	22.00 to 23.00
India, 2.25 to 2.75 silicon, delivered cars, Boston	22.50 to 23.00
No. 2 Alabama, Birmingham	21.00 to 22.00
No. 2, Alabama, Cincinnati	24.69 to 25.69
No. 2 Tenn., Birmingham	21.00
No. 2 Tenn., Cincinnati	24.69
No. 2 southern, Philadelphia	27.01 to 28.01
No. 2 southern, Chicago	27.01 to 28.01
No. 2 southern, Chicago (barge and rail)	25.18
No. 2 southern, Boston (rail and water)	27.91 to 28.91
No. 2 southern, Cleveland	27.01 to 28.01
No. 2 southern, St. Louis	25.42 to 26.42
No. 2X, Virginia, furnace	24.00
No. 2X Virginia, Phila.	29.17
No. 2X, Virginia, Jersey City	29.54
Gray forge, eastern Pa.	23.00 to 23.50
Gray forge, val. del. Pitts.	21.76
Low phos., standard, valley	28.00 to 28.50
Low phos., standard Phila.	24.76 to 27.79
Low phos., Lebanon, furnace	24.00 to 25.00
*Low Phos., English	24.00 to 25.01
Charcoal, Birmingham	30.00 to 32.00
Charcoal, Superior, Chicago	29.04

Silvery iron Jackson county, Ohio furnace, 5 per cent $26.50; 6 per cent $27.50; 7 per cent $28.50; 8 per cent $29.50; 9 per cent $31.00; 10 per cent $33.00; 11 per cent $35.00; 12 per cent $37.00; 13 per cent $39; and 14 per cent $41.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent $35.00; 11 per cent $37.00; 12 per cent $39.00; 13 per cent $41.00; 14 per cent $43.00; 15 per cent $45.50; 16 per cent $48.00; 17 per cent $50.50.

*Duty paid, delivered Philadelphia consumers.

Chicago, Dec. 8.—Sales of northern pig iron continue to reach a good total but consumers' requirements for December have been well met and the approaching inventory period prompts melters to keep stocks down. Production for the first quarter on the present basis of eight active furnaces has been well sold. The market is firm at $23, Chicago furnace, for No. 2 foundry and malleable and $23.50 for No. 1 foundry, though occasionally special spot iron commands a premium. A sale of 250 tons of charcoal iron is reported, while a similar inquiry for the first quarter is pending. Charcoal iron is unchanged at $29.04, Chicago. Low phosphorus and silvery iron are inactive. Some sales of southern barge iron have been made on the basis of $26.18, delivered Chicago. Birmingham iron is quoted $27.01 to $28.01, Chicago.

Cincinnati, Dec. 8.—Virtually all furnaces in southern Ohio have 75 to 80 per cent of their first quarter output sold. Sales in the past week aggregated 500 tons, of northern and silvery iron. The Dayton Steel Foundries Co., Dayton, O., bought 1000 tons of low phosphorus iron. The Henry Vogt & Son Co., Louisville, Ky., wants 500 tons of southern iron for first quarter. Northern iron is quoted $21, Ironton, for shipment this year and $21.50 for first quarter, but $21 can be done on tonnage. The market on southern iron now ranges from $21 to $22, Birmingham, the Rookwood furnace having advanced its price $1 a ton on Tennessee iron.

St. Louis, Dec. 7.—The approach of inventory period is being reflected in a slowing down in pig iron sales and inquiry. Preliminary reports indicate an increase of 4 to 6 per cent in the November melt in this district over that of October, and about 12.3 per cent over the total of November last

year. Prices are firm. The $21.50 price on No. 2 southern has disappeared, the lowest offering now being $22, Birmingham. Northern iron is $23, furnace, with offerings limited. The leading local producer, which has sold its output through the first quarter, is quoting nominally $23.50 to $24.00 f.o.b. Granite City.

Birmingham, Ala. Dec. 7.—Sales of pig iron are confined to small lots. Furnace interests assert they are out of the market. Quotations are $22 to $23, base, furnace. Two furnaces are scheduled for resumption in January.

New York, Dec. 8.—Between 5000 and 6000 tons of pig iron was sold in this territory in the week, all foundry grades. Prices are unchanged at $21 to $22, base Buffalo, plus 50 cents for No. 2X; plus $1 for No. 1X; and $23, base eastern Pennsylvania, plus the same differentials as for Buffalo iron. European iron prices are unchanged, with plenty obtainable. Small lots of Swedish foundry iron have been sold at fancy prices.

The Port Henry furnace, scheduled to blow Nov. 28, still is idle. The Colonial furnace, Riddlesburgh, Pa., now is expected to light about Jan. 1. The Hokendauqua furnace may light in January.

Ferroalloys

New York, Dec. 8.—Sales of both ferromanganese and spiegeleisen are in smaller volume. Prices on both these metals are unchanged.

Contracting is going ahead on special ferroalloys for 1926 at unchanged prices. This is especially true of chrome and silicon, while on vanadium, contracts also are possible. Ferrotungsten is unchanged, and so are ferromolybdenum and ferrotitanium. Good business is reported in these alloys also. The markets on ores are unchanged and firm.

Pittsburgh, Dec. 8.—Limited activity in ferroalloys is noted in this territory. A few small lots of ferromanganese both English and domestic were ordered last week at unchanged figures, $115 base. The Standard Steel Car Co., Butler, Pa., bought two carloads of spiegeleisen at $34 and the Erie Malleable Iron Co., wants a like quantity. The Youngstown Sheet & Tube Co., which contracted for last half and later added 20 per cent to that tonnage, already has taken out that excess and now wishes to buy more for delivery this month. Other users likewise are increasing their consumption of spiegeleisen. Shipments against this quarter's contracts on all alloys continue at a high rate. Practically all 50 per cent ferrosilicon contracts for 1926 have been written and carry the $85 freight allowed figure. Ferrochrome has sold at 11½ cents.

Chicago, Dec. 8.—Neither spiegeleisen nor ferromanganese manifests any marked activity. Ferromanganese is firm at $115, seaboard, and spiegeleisen at $34, domestic furnace. Considerable tonnage for the first quarter in both ferroalloys remains to be placed.

Ferroalloy Prices

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$115.00
Ferromanganese delivered Pittsburgh	119.79
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	34.00
Ferrosilicon, 50 per cent contract freight allowed	85.00
Ferrotungsten standard, cents per pound contained	1.10 to 1.18
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	11.00 to 11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.25 to 4.00
Ferro-carbon-titanium, car lots, producer's plant, net ton	200.00
Ferrophosphorus, electrolytic, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent material	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23 to 25 per cent, f.o.b. Anniston, Ala., (24 per cent material)	122.50

†Duty paid

Coke

Easier Trend Noted in Market —Furnaces Show More Interest, But Delay Negotiations

A CONTINUATION of mild weather has slowed down sales of beehive and by-product coke. The Connellsville market shows an easier tendency. Small spot lots for filling in at blast furnaces are bringing $3.50 to $3.75. Valley furnaces have postponed negotiations for the first quarter when quoted closed at $5 to $6.

Pittsburgh, Dec. 8.—Some clarification of the first quarter beehive coke situation may come before another week. Inquiries by several valley furnaces so far meet nothing but $4.50 to $5 quotations for that period. Cokemakers will not listen to counter offers to pay $4, hence one or two consumers have called off negotiations. It is expected, however, some oven operators may be willing to quote $4.25 to collect a backlog. The Bethlehem Steel Corp. is shipping 60 carloads of by-product coke daily to Washington and Baltimore, and more in other directions. Heavy Connellsville production with comparatively mild weather have caused further weakness in the spot market. Sales up to 25 carloads at a time to blast furnaces for filling in are made at $3.75. Other smaller lots brought $3.50 yesterday. Medium sulphur coke is selling in small lots at $3.10 to $3.40. Crushed beehive coke is selling at $5 to $5.50 in lots of five to ten carloads. Numerous foundry coke negotiations under way for first quarter start at $6. Some makers are quoting around $5. A few have been closed up within that spread. Some spot sales are noted at $5 to $5.25.

Production of coke in the Connellsville region for the week ended Nov. 28 was 204,600 tons, compared with 200,320 tons the preceding week, according to the *Connellsville Courier*.

Cincinnati, Dec. 8.—Coke producers and sellers are renewing contracts for next year. The movement of beehive coke is on a smaller scale than for many weeks. A car shortage is hindering the movement from the Wise County and New River districts. Prices are firm.

Boston, Dec. 8.—The coke market has further softened as the result of large importations and Connellsville tonnage offered at Boston. The foundry by-product price is unchanged at $13, delivered. Shipments have declined.

New York, Dec. 8.—Spot coke business is heavy, requirements being larger than anticipated. Considerable contracting is noted. Beehive foundry is $5.50 to $5.75, Connellsville, for the first half, and $6.25 to $6.50 for first quarter. Spot furnace coke is bringing $4 to $4.25. The price of by-product foundry coke is unchanged.

St. Louis, Dec. 7.—By-product plants in this district report November coke shipments the heaviest for any single month on record. Foundry coke is active, with demand slightly in excess of supply. Prices are firm.

Birmingham, Ala., Dec. 7.—Every ton of coke that can be made is finding a market. Production is heavier than at any time in years and quotations are firm at $5.75 to $6 for the foundry grade. Spot coke sometimes commands a premium of 50 cents.

Coke Prices

Beehive, Ovens

Prices per net ton

Connelsville, furnace	$3.50 to 5.00
Connellsville, foundry	5.00 to 6.00
New River foundry	7.50 to 8.00
New River furnace	6.25
Wise county furnace	6.00
Wise county foundry	7.00
Alabama foundry	5.75 to 6.50
Alabama furnace	5.50

By-Product

Foundry, Newark, N. J.; del.	$11.61 to 11.52
Foundry, Chicago, ovens	10.50
Foundry, New England, del.	13.00
Foundry, St. Louis	10.00
Foundry, Granite City, Ill	10.00
Foundry, Birmingham	5.75 to 6.00
Foundry, Indianapolis, del.	11.25

The Market Section

Plates

Large Tonnages Placed for Stills and Gas Holders—Prices Show More Firmness

A LARGER miscellaneous tonnage of plates has been placed, those for stills and gas holders featuring the week's orders. The Standard Oil Co. of Indiana has closed for 135 stills requiring 2850 tons of plates. For two gas holders 5000 tons is involved and 4000 tons for a Texas water tower. Prices show more firmness, especially in the East.

PLATE PRICES, PAGE 1480

Philadelphia, Dec. 8.—All eastern platemakers are quoting 1.80c, Pittsburgh, for first quarter. Most mills refuse to sell for any delivery under 1.80c, although lower prices have not entirely disappeared. Eastern mills are hoping 1000 to 2000 gondolas for the Reading railroad will be placed with eastern builders, which would give them a chance to bid on 6000 to 12,000 tons of plates.

Boston, Dec. 8.—Most eastern producers have advanced the plate price to 1.80c, Pittsburgh. Consumers are well protected at 1.60c for the balance of the year. Demand has improved slightly.

Pittsburgh, Dec. 8.—While no haste characterizes customers' efforts to book their first quarter plate requirements, makers are taking a firm stand at 1.90c minimum. Some quote 2.00c on small lots for immediate delivery. One or two like the Bethlehem Steel Corp., have booked some customers' requirements this quarter, and because of heavy tonnages involved, deliveries will run into the first quarter. Oil tank inquiries are the lowest in 15 years, but 135 refinery stills and about 5000 tons for gas holders have been placed.

Cleveland, Dec. 8.—Advances of plate prices by eastern mills stand forth in the market. Capacity of these makers has been filling freely and where they have been quoting 1.90c, Pittsburgh for tonnage after Jan. 1, some of them now ask 1.90c for any delivery. Pittsburgh mills quote 1.90c. The stronger market is resulting from a sustained flow of tonnage from many directions.

New York, Dec. 8.—The plate market is much firmer. Makers are withdrawing lower prices. It now is difficult to shade 1.80c, Pittsburgh. Several first quarter contracts have been placed at this figure. Consumers in several instances have failed to buy for the first quarter at less. The Newport News Shipbuilding & Dry Dock Co. has booked another Clyde liner the third recently, which requires 2800 tons of steel, mainly plates which has been placed with the Carnegie Steel Co.

Chicago, Dec. 8.—The 20,000 tons of finished steel required for the 2000 Wabash railroad cars will be placed with Chicago district makers. The Humble Oil Co. is reported letting a number of tanks. Cosden & Co. have not yet closed on 5000 tons for work in the Oklahoma fields. The Standard Oil Co. of Indiana's 3000 tons of plates for stills and tanks for the Casper, Wyo., field was spread equally among the Mt. Cooper Boiler Co., Tulsa, Okla.; James G. Heggie & Sons, Joliet, Ill., and the Struthers-Wells Co., Warren, Pa. Plate mill capacity is taken practically solid over December and into January. Plates are firm at 2.10c, Chicago.

CONTRACTS PLACED

3500 tons, 10,000,000-cubic foot gas holder, Buffalo, to the Stacy Bros. Gas Construction Co.

3450 tons, mostly plates, for blast furnace and stoves, Midland Coke & Iron Corp., St. Louis; general contract signed Nov. 25, awarded the Riter-Conley Co.

2850 tons, 135 stills for the Standard Oil Co. of Indiana, Casper, Wyo., divided in three lots of 45 stills each awarded James G. Heggie & Sons, Joliet, Ill.; Mt. Cooper Boiler Co., Tulsa, Okla.; and the Struthers-Wells Co., Warren, Pa.

2800 tons, Clyde liner, to Newport News Shipbuilding & Dry Dock Co., steel to Carnegie Steel Co. This is the third Clyde liner boked by Newport recently.

1800 tons, 3,000,000-cubic foot gas holder for the St. Louis Gas Co., Webster Grove., Mo., to the Stacy Mfg. Co.

200 tons, barge for Libby, McNeil & Libby, for export to Hawaiian Islands, to Pacific Coast Engineering Co.

600 tons, gas holder, Phoenix Utilities Co., Lakeland, Fla., to Stacey Mfg. Co.

400 tons, 1,000,000-gallon water tower, San Antonio, Tex., to the Pittsburgh-Des Moines Steel Co.

1700 tons, tank work for an alcohol plant at Carneys Point, N. J., for DuPont Engineering Co., to Hammond Iron Works.

320 tons, penstock, Mollys Falls, N. H., to Walsh's Holyoke Steam Boiler Works, through Continental Pipe Mfg. Co.

CONTRACTS PENDING

2500 tons, plates for barges for the Inland Waterways Corp., Washington, D. C., for use on the Mississippi river; bids being compiled.

2000 tons, sheet piling for dams Nos. 46, 50, 52 and 53, Ohio river; bids close Dec. 28 by United States Engineers, Louisville, Ky.

Semifinished

Valley Mills Booked Through First Quarter—Prices Show Strength

VALLEY mills are booked practically to capacity for first quarter on sheet bars, billets and slabs, and this has had a strengthening influence in the northern Ohio markets, premiums being paid in some instances for early shipment. However, additional orders for 4 x 4-inch billets and slabs have been taken by Pittsburgh makers at $35. Sheet bars are firm at $36.

SEMIFINISHED STEEL PRICES, PAGE 1480

Pittsburgh, Dec. 8.—Additional billet and slab business has been closed. The 4 x 4-inch billets brought $35, and smaller size $36 to $37.50. On the 4 x 4-inch rerolling billets, as high as $36 is being quoted for delivery subsequent to Jan. 1. Prompt deliveries of forging billets are available in limited tonnages at $40, and specifications against such contracts are liberally furnished, with $41 quoted by one or two makers for first quarter delivery. Sheet bars are firm at $36 and the supply is tightening. Skelp contracts will soon be written for first quarter, the present quotation being 1.90c to 2.00c. Wire rods are quoted at $45 to $46, some contracts already being extended for first quarter at that figure.

Youngstown, O., Dec. 8.—All production of sheet bars, billets and slabs from mills in this district is sold for first quarter, and any new demands will have to be satisfied by outside mills. Sheet bar and small billet contracts were closed a few weeks ago at $36, Youngstown, while large billets and slabs commanded $35, Youngstown. The bulk of first quarter semifinished output will be in the form of sheet bars. Specifications for this product for December shipment are being received unsolicited, the volume reflecting high operations.

Cleveland, Dec. 8.—A stronger price situation is apparent in the market for sheet bars, billets and slabs, due to the fact valley mills are booked practically full for the first quarter and demand in this and nearby districts has not been satisfied. The leading mill interest here has booked most of its output for first quarter. The sale of 500 tons of small billets at $38.50, Cleveland, to a nearby consumer is noted. Delivery point takes the same freight rate as that from the valley. The Cleveland mill continues to quote $38, Cleveland, Youngstown, or Pittsburgh, on sheet bars, 4 x 4-inch billets and slabs.

Iron and Steel Scrap Prices

Corrected to Tuesday Noon. Gross Tons Delivered to Consumer

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.00 to 14.50
Boston (dealers)	12.50 to 13.00
Buffalo	18.00 to 18.50
Buffalo, No. 1	19.50
Chicago	16.00
Cincinnati (dealers)	14.00 to 14.50
Cleveland	17.50 to 17.75
Detroit	15.00 to 15.50
Eastern Pennsylvania	18.00 to 18.50
Bethlehem delivery	17.00 to 17.50
New York (dealers)	12.50 to 13.00
Pittsburgh	19.00 to 19.50
St. Louis	15.50 to 15.75
Valleys	18.50 to 18.75

COMPRESSED SHEETS

Buffalo	18.00 to 18.50
Chicago	14.00 to 14.50
Cleveland	15.00 to 15.75
Detroit	12.75 to 13.25
Pittsburgh	18.00 to 18.50
Valleys	17.00 to 17.50

BUNDLED SHEETS

Buffalo	15.00 to 15.50
Cincinnati (dealers)	10.00 to 10.50
Cleveland	12.50 to 12.75
Eastern Pennsylvania	15.50
Pittsburgh	17.00 to 17.50
St. Louis	10.25 to 10.75
Valleys	15.25 to 15.75

SHEET CLIPPINGS, LOOSE

Chicago	9.50 to 10.00
Cincinnati	10.00 to 10.50
Detroit	10.00 to 10.50

STEEL RAILS, SHORT

Birmingham	14.00 to 14.50
Buffalo	19.50 to 20.00
Chicago	19.50 to 20.00
Cincinnati (dealers)	17.50 to 18.00
Cleveland (over 6 ft.)	16.75 to 17.00
Detroit	17.00 to 17.50
St. Louis	19.25 to 19.75

STOVE PLATE

Birmingham	14.00 to 14.50
Boston (consumers)	14.00 to 14.50
Buffalo	15.00 to 15.25
Chicago	16.75 to 17.25
Cincinnati (dealers)	10.50 to 11.00
Cleveland	13.75 to 14.00
Detroit (net tons)	13.25 to 13.75
Eastern Pennsylvania	15.50
New York (dealers)	10.50 to 12.00
Pittsburgh	14.00 to 14.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo	20.50 to 21.00
Cincinnati (dealers)	18.00 to 18.50
Eastern Pennsylvania	21.00 to 22.00
Pitts. billet and bloom crops	24.00 to 24.50

SHOVELING STEEL

Chicago	15.75 to 16.00
Pittsburgh	14.50 to 15.00
St. Louis	15.50 to 15.75

KNUCKLES, COUPLERS, SPRINGS

Chicago	18.75 to 19.25
Eastern Pennsylvania	20.50 to 21.50
Pittsburgh	22.50 to 23.00
St. Louis	18.00 to 18.50

FROGS, SWITCHES, GUARDS

Chicago	17.50 to 18.00
Eastern Pennsylvania	17.00 to 17.50
St. Louis	18.00 to 18.50

ANGLE BARS—STEEL

Buffalo	16.50 to 17.00
Chicago	18.50 to 19.00
St. Louis	17.25 to 17.75

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	13.00 to 13.50
Boston (dealers)	13.50 to 14.00
Buffalo, No. 1	15.75 to 16.25
Buffalo, No. 2	18.50 to 19.00
Chicago, No. 1	15.75 to 16.25
Chicago, No. 2	16.00
Cincinnati, No. 1 (dealers)	10.00 to 10.50
Cleveland, No. 1	13.75 to 14.25
Eastern Pennsylvania	18.50 to 19.00
New York, No. 1 (dealers)	15.00 to 16.00
Pittsburgh, No. 1	15.50 to 16.00
Pittsburgh, No. 2	19.00 to 19.50
St. Louis, No. 1	15.00 to 15.50
St. Louis, No. 2	15.50 to 15.75

WROUGHT PIPE

Boston (dealers)	12.00 to 12.50
Buffalo	15.00 to 15.50
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	12.75 to 13.25

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	17.00 to 17.50

BUSHELING

Buffalo	17.50 to 18.00
Chicago, No. 1	14.00 to 14.50
Chicago, No. 2	9.50 to 10.00
Cincinnati, No. 1 (dealers)	11.00 to 11.50
Cleveland, No. 1	14.75 to 15.00
Cleveland, No. 2	14.25 to 14.50
Eastern Pennsylvania	14.00 to 15.00
Pittsburgh, No. 1	17.00 to 17.50
St. Louis, No. 1	13.50 to 14.00

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston (chemical)	10.00 to 10.50
Buffalo	13.25 to 13.75
Chicago	10.00 to 10.50
Cincinnati (dealers)	10.00 to 10.50
Cleveland	14.25 to 14.50
Detroit	10.75 to 11.25
Eastern Pennsylvania	15.50
New York (dealers)	11.00 to 11.50
Pittsburgh	14.50 to 15.00
St. Louis	10.00 to 10.50
Valleys	12.50 to 13.00

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	8.00 to 9.00
Boston (chemical)	11.50 to 12.00
Boston (dealers)	10.00 to 10.50
Buffalo	13.25 to 13.75
Chicago	13.50 to 13.75
Cincinnati (dealers)	10.50 to 11.00
Cleveland	14.75 to 15.25
Detroit	11.00 to 11.50
Eastern Pennsylvania	15.00
Eastern Pennsylvania (chem.)	17.00 to 17.50
New York (dealers)	10.75 to 11.25
Pittsburgh	15.00 to 15.50
St. Louis	12.50 to 13.00
Valleys	13.50 to 13.75

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	9.00 to 10.00
Buffalo	13.00 to 13.50
Cincinnati (dealers)	10.00 to 10.50
Cleveland	14.75 to 15.00
Detroit	11.25 to 11.75
Eastern Pennsylvania	14.00 to 14.50
New York (dealers)	10.75 to 11.25
Pittsburgh	14.50 to 15.00

PIPES AND FLUES

Chicago	13.00 to 13.50
Cincinnati (dealers)	9.00 to 9.50
Cleveland	12.25 to 12.50
St. Louis	12.00 to 12.50

RAILROAD GRATE BARS

Buffalo	14.50 to 14.75
Chicago	16.25 to 16.75
Cleveland	13.75 to 14.00
Eastern Pennsylvania	15.50
New York (dealers)	12.00 to 12.50
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	10.00 to 10.50
Buffalo	14.50 to 15.00
Chicago	11.50 to 12.00
Cleveland (under 10 in.)	14.25 to 14.50
Cleveland (over 10 in.)	14.25 to 14.50
Detroit	10.75 to 11.25
Pittsburgh	16.00 to 16.50

FORGE SCRAP

Boston (dealers)	10.00 to 10.50
Chicago	19.00 to 19.50
Eastern Pennsylvania	15.25 to 15.75

ARCH BARS AND TRANSOMS

Chicago	23.50 to 24.00
St. Louis	22.50 to 23.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	10.00 to 10.50
Buffalo	15.00 to 15.50
Chicago	14.50 to 15.00
Cleveland	15.25 to 15.50
Eastern Pennsylvania	15.50 to 16.00
Pittsburgh	18.00 to 18.50
St. Louis	13.50 to 14.00

STEEL CAR AXLES

Birmingham	18.00 to 20.00
Boston (shipping point)	18.00 to 19.00
Buffalo	20.00 to 20.50
Chicago	19.25 to 19.75
Cleveland	18.00 to 18.50
Eastern Pennsylvania	24.00 to 25.00
Pittsburgh	23.00 to 23.50
St. Louis	20.50 to 21.00

SHAFTING

Boston (shipping point)	18.50 to 19.00
Chicago	21.25 to 21.75
Eastern Pennsylvania	23.00 to 23.50
New York (dealers)	18.50 to 19.50
St. Louis	18.00 to 18.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	16.00 to 16.50
Boston (consumers)	17.50 to 18.00
Buffalo, iron	17.00 to 17.50
Buffalo, steel	19.50 to 20.00
Chicago, iron	18.50 to 19.00
Chicago, steel	19.00 to 19.50
Cincinnati	13.50 to 14.00
Eastern Pennsylvania	18.50 to 19.00
New York iron (dealers)	15.00 to 15.50
Pittsburgh, iron	19.00 to 19.50
Pittsburgh steel	22.00 to 22.50
St. Louis, iron	18.00 to 18.50
St. Louis, steel	19.00 to 19.50

NO. 1 CAST SCRAP

Birmingham, cupola	17.00 to 17.50
Boston	19.00 to 19.50
Buffalo	17.00 to 17.50
Chicago, No. 1 machinery	20.50 to 21.00
Chicago No. 1 railroad or agricultural	19.25 to 19.75
Cincinnati No. 1 Machinery cupola (net tons dealers)	18.50 to 19.00
Cleveland, cupola	18.00 to 18.50
Detroit (net tons)	15.00 to 15.50
Eastern Pennsylvania, cupola	18.00 to 18.50
New York, cupola (dealers)	15.00 to 15.50
Pittsburgh, cupola	17.50 to 18.00
San Francisco, delivered	20.00 to 21.00
Seattle	18.00
St. Louis, railroad	17.00 to 17.50
St. Louis, agricultural	17.00 to 17.50
St. Louis, machinery	19.00 to 19.50
Valleys	18.00 to 18.50

HEAVY CAST

Boston	16.50 to 17.00
Buffalo (breakable)	16.50 to 17.00
Cleveland	13.00 to 13.50
Detroit (automobile) (net tons)	20.00 to 20.50
Eastern Pennsylvania	17.00 to 17.50
New York (dealers)	14.50 to 15.00
Pittsburgh	16.75 to 17.25

MALLEABLE

Boston, railroad	19.00 to 19.50
Buffalo	20.00 to 20.50
Chicago, agricultural	17.00 to 17.50
Chicago, railroad	18.50 to 19.00
Cincinnati, railroad (dealers)	15.50 to 16.00
Cincinnati, agricultural (dealers)	17.00 to 17.50
Cleveland, agricultural	18.50 to 18.75
Cleveland, railroad	19.50 to 20.00
Detroit	15.50 to 16.00
Eastern Pennsylvania, railroad	17.00
Pittsburgh, railroad	20.50 to 21.00
St. Louis, agricultural	15.50 to 16.00
St. Louis, railroad	16.75 to 17.25

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	17.50 to 18.00
Boston (dealers)	13.00 to 13.50
Buffalo	18.00 to 18.50
Chicago	18.75 to 19.25
Cleveland	17.25 to 17.50
Eastern Pennsylvania	18.50 to 19.00
New York	15.50 to 16.00
Pittsburgh district	21.00 to 21.50
St. Louis	19.50 to 20.00

LOCOMOTIVE TIRES

Chicago, No. 1	18.00 to 18.50
Chicago, cut	19.00 to 19.50
St. Louis, No. 1	17.00 to 17.50

LOW PHOSPHORUS PUNCHINGS

Chicago	18.00 to 18.50
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	21.50 to 22.00

Scrap

Slack Conditions at Year End Weaken Prices—Buying in Small Volume

APPROACH of inventory and desire of consumers to have small stocks to carry over to the new year has brought buying to a minimum, sufficient for immediate needs. Prices have weakened under an unusual supply of material, expedited by open weather. Dealers furnish most activity. Railroad tonnage continues to command better prices than current quotations.

Chicago, Dec. 8.—Iron and steel scrap has reacted to a number of factors, chiefly heavy receipts and light consuming demand, and most grades are off 50 cents. For some weeks the market has been top-heavy in the matter of supply. Open weather has expedited the movement of scrap to this market. Production of scrap has been heavy. An increasing tonnage is passing directly from producer to consumer, though less noticeable here than in the East. Larger buyers are out of the market, their stocks are heavy and inventory time nears. Smaller users, however, are being attracted by reduced prices. Dealers with short orders are making the most of their opportunity. It is the opinion of a leading dealer that while the market may go slightly lower, current prices are below the cost of production of scrap and the situation will naturally right itself. Dealers are trading in melting steel at $15.85 and $15.75. The best that cast borings now command is $13.75. A steelworks has paid $19 for iron wheels.

Boston, Dec. 8.—Demand for heavy melting steel continues fairly heavy in New England and inquiry has appeared from Pennsylvania steel works. Dealers are paying $13.25 shipping point. Mixed borings and turnings are in better demand and are quoted at $9.75 shipping point.

New York, Dec. 8.—Scrap prices continue strong, with advances in car wheel, mixed borings and turnings and grate bars, of about 50 cents a ton. Mixed borings and turnings are being bought for shipment to Bethlehem, Pa., at $14, delivered. Heavy melting and No. 1 railroad steel are unchanged. Trading is fairly active.

Philadelphia, Dec. 8.—Several sales of heavy melting steel have been made at $17.50 to $18.50. The market is somewhat easier and most consumers are covered for the remainder of the year. Dealers expect improved operation of steel works will bring considerable buying after Jan. 1.

Pittsburgh, Dec. 8.—The approach of inventory season is causing a slack scrap market with weakness in some prices. Heavy melting steel continues quotable at $19 to $19.50 but nobody will pay that much and it is understood that around $18 was paid for off-grade material this week by a down-river consumer. A sale of No. 1 cupola cast is noted at slightly above $18, but $17.50 to $18 is considered a fairly representative quotation. Heavy breakable cast is down 25 cents on the basis of late sales and rails for rolling declined $1, $21.50 being the highest figure paid recently. Heavy melting steel on the Pennsylvania railroad list brought about $19.25 to $19.50, with correspondingly high figures on the other grades.

Buffalo, Dec. 8.—The scrap market is quiet with no buying on a large scale in prospect until January. Dealers are making quick shipments and this volume of business in the district is satisfactory. Material is being moved on narrow margins of profit due to wide distribution of contracts and competition for tonnages. Prices are steady and unchanged, and largely governed by dealer's transactions.

Cleveland, Dec. 8.—Limited movement of iron and steel scrap is noted in this district beyond that going forward on contract. Some inter-dealer buying is being done for filling-in purposes but consumers are taking practically no new tonnage as invoicing time approaches. Prices show little change but most grades are weak.

Detroit, Dec. 8.—Demand for iron and steel scrap is lessened. Dealers find lack of interest on the part of consumers and activity is between dealers. As a result of the stagnant demand, prices are weak and unsteady. Some grades show a decline since the first of the month and all are more or less nominal.

Cincinnati, Dec. 7.—Heavy offerings by railroads with light buying has prompted dealers to reduce buying prices 50 cents a ton. The Wheeling Steel Corp. at Portsmouth, O., has again placed an embargo on shipments as it has scrap for the remainder of this year. The Norfolk & Western railroad has closed 7000 tons.

St. Louis, Dec. 7.—Purchasing of iron and steel scrap is in light volume and on a necessity basis. Melters with the inventory period in mind are endeavoring to hold stocks as small as safety will permit. Railroad offerings decreased sharply as compared with the preceding week, the only lists out being 750 tons by the Frisco, 400 tons by the Chicago & Western Indiana and 700 tons by the Chicago & Eastern Illinois.

Birmingham, Ala., Dec. 7.—A little lagging is felt in demand for iron and steel scrap but delivery on contracts is active. Quotations show no weakness. Heavy melting steel holds at $14.

Sheets

Specifications for First Quarter Larger—Higher Price Levels Are Holding

FURTHER improvement in sheet business is apparent from market reports this week. A heavier tonnage is coming out in the form of specifications on first quarter contracts. On the majority of new orders placed during the week the higher prices have applied. Tonnage booked recently at the lower levels will be shipped out by the last week of this month.

SHEET PRICES, PAGE 1480

Youngstown, O., Dec. 8.—Sheetmakers in this district have no tonnage to offer for the remainder of this year. From all indications, numerous producers will carry over a fair proportion of tonnage into the first quarter. Most mills will have all low priced tonnage worked off their books within the next two weeks and then will be rolling tonnage taken on the present market basis of 2.60c for blue annealed, 3.35c for black and 4.60c for galvanized. Producers generally report first quarter buying is being done on an increased scale. The majority of this tonnage is on the contract basis and many mills already have been favored with specifications. While a little high-grade tonnage is being placed for next quarter, most of the large buyers have deferred action until inventory is completed. A canvass of the situation in the Detroit district reveals that automobile producers next year are planning to surpass all records in the production of pleasure cars. Indications are that placement of high-grade sheets for first quarter consumption will be heavy. The price on this grade is firm at 4.50c with the revised clause for the disposition of seconds applying. Surplus material on mill floors is scarce. One sheetmaker here is endeavoring to get $47 a ton on mill cut-downs unassorted as to gages or sizes.

Philadelphia, Dec. 8.—Sheet specifications are heavy. Consumers are taking their full fourth quarter tonnage, in view of higher prices Jan. 1.

Boston, Dec. 8.—First quarter requirements for sheets are well covered, the total running in excess of

last year. Spot demand is improved, and prices are firmer than a year ago. Galvanized sheets hold at 4.60c, Pittsburgh.

Pittsburgh, Dec. 8.—Sufficient competitive business is booked by sheetmakers who maintain the levels of 2.50c, 3.35c, 4.60c and 4.50c on blue annealed, black, galvanized and full-finished sheets respectively to indicate that these prices are firm. In one or two minor instances some concessions have appeared on black and blue annealed amounting to about $2 per ton. In some cases 40 to 75 per cent of the business involved in inquiries was awarded to companies quoting the foregoing levels. Some automotive sheet buyers wished to close for first half requirements. They indicate tonnages 50 per cent or more above those taken out in the last half of this year. The American Sheet & Tin Plate Co. started out last week on a 95 per cent basis but finished at about 93½ per cent, which it plans to maintain this week. The independents are operating at 85 to 95 per cent. The leading interest is transfering a number of orders from its western mills to the Pittsburgh territory, particularly on galvanized for shipments to points where the freight differential is equalized by the Gary price differential. Export business is coming in good shape, orders being particularly heavy on all grades from Canada including large galvanized.

Buffalo, Dec. 8.—Sheet specifications for the first quarter have slowed up, although Buffalo mills have heavy unfilled tonnage. It is reported that black can be had for 3.30c, Pittsburgh, although the nominal quotation is 3.35c. One Buffalo works is producing 10,000 tons of sheets monthly.

Chicago, Dec. 8.—Chicago district sheetmakers are operating full and have an average of six weeks work ahead of them. A lack of semifinished steel is handicapping one interest. With deliveries pushed back into January, inventory time is no deterrent to buying. The market is firm on the basis of the recent advances to 4.75c, Chicago, for galvanized, 3.50c for black and 2.65c for blue annealed.

St. Louis, Dec. 7.—Sheet orders for first quarter are in excess of the same time last year. Buying is of a general character. Shipments continue heavy, and prices are firm.

Tin Plate

Operations Slightly Slower—Standard of New Jersey Business Placed

TIN PLATE PRICES, PAGE 1480

Pittsburgh, Dec. 8.—Tin plate operations among the independents have slipped several notches, particularly at a McKeesport plant where some labor difficulty developed last week. Operation was on a 35 or 40 per cent basis there but the general average of the independents is slightly less than 70 per cent, while the American Sheet & Tin Plate Co., still continues at 80 per cent or slightly higher. It is understood that the Standard Oil Co. of New Jersey has divided its first half business between the leading interest and the Bethlehem Steel Corp. but the Standard Oil Co. of New York has not closed. The price of $5.50 Pittsburgh for base box remains firm.

Strip Steel

Full Specifications Being Filed Against Current Contracts

STRIP PRICES, PAGE 1480

Pittsburgh, Dec. 8.—No difficulty has been experienced by hot and cold-rolled strip steel makers in obtaining specifications against this quarter's contracts because the higher current market levels naturally drive them in. Some users have stopped ordering for the remainder of this month or for two weeks at least, particularly in the automotive group where several manufacturers plan to shut down for two weeks' inventory. Prices are unchanged and some already have heavy commitments for first quarter at 3.90c on cold and 2.30c on hot. Strip mills have been able to maintain 80 per cent operating schedules but between now and the end of the year this average will shrink somewhat.

Pipe

Mill Operations Continue Drop —Cast Buying Unusually Heavy —Mill Prices Variable

LACK of well rounded buying of oil country pipe and line pipe has caused mill operations to diminish to 60 to 65 per cent. Cast iron pipe buying continues heavy. New York public utilities are to buy 10,000 to 15,000 tons in addition to 30,000 tons just closed. Detroit buyer recommends allotting 8000 tons of its 17,000-ton order to French makers. Texas will buy foreign pipe.

PIPE PRICES, PAGE 1480 AND 1522

Chicago, Dec. 8.—The Detroit water board is understood to have recommended awarding the United States Cast Iron Pipe & Foundry Co. 3300 tons of 6-inch and 5700 tons of 8-inch pipe and B. Nicoll & Co., New York, representing a French maker, 4000 tons each of 12 and 16-inch. The United States company bid $47.95, delivered, on the 6 and 8-inch and the Nicoll company $45.32 on the 12-inch and $45.12 on the 16-inch. For the country as a whole, bookings of cast iron pipe about equal shipments, with buying showing a natural downward tendency at this season. The market on cast iron pipe 6-inch and over is $50.20, delivered Chicago, and one maker is holding this price open only for two weeks.

Boston, Dec. 8.—Providence, R. I., is taking bids on 1400 tons of 6 to 24-inch cast pipe. New Britain, Conn., wants 500 tons of 16-inch pipe. Nearly all gas companies in the district are buying now for first half needs. Prices hold firm.

New York, Dec. 8.—Demand from gas companies still features the cast pipe market. Although close to 30,000 tons has been placed by local utility companies with the United States Cast Iron Pipe & Foundry Co., as reported in last week's issue, fully 10,000 to 15,000 tons still is pending for these interests. The bulk of this is for the Consolidated Gas & Electric Co.

Pittsburgh, Dec. 8.—Occasional orders of fair size of standard full weight merchant pipe are placed by jobbers, but lacking extensive oil country goods buying pipe mill operations are suffering considerably. The average has dropped to 60 to 65 per cent. Large line pipe business is scarce although some mills still have some to work off on old orders. As is usual in a time of slack demand, the price is not entirely firm, in some cases an extra 2½ per cent being granted.

Birmingham, Ala., Dec. 7.—New cast iron pressure pipe business is mostly from the West and a little in the North. Much of it is for immediate delivery. Unfilled tonnage for spring is heavy. Quotations on 6-inch and over are firm at $42 per ton.

Ft. Worth, Tex., Dec. 7.—Because of high freight rates from Birmingham, Ala., to Forth Worth an order for 12,000 tons of cast iron pipe will be let in Europe according to city officials. The pipe is to be used for extending the water works system. It will be shipped by water to Galveston or Houston, thence by rail to Forth Worth. Quotations on cast iron pipe have been received from a number of European manufacturers and the prices range much lower than it can be purchased in the United States with the freight rate added.

CONTRACTS PENDING

1400 tons, 6 to 16-inch for Providence, R. I.; William H. Mueller & Co., representing German makers low. On previous bid B. Nicoll & Co., representing French maker was low.

500 tons, 16-inch water system, New Britain, Conn.; pending.

Stowell Co. To Continue

Action by stockholders of the Stowell Co., South Milwaukee, Wis., in placing affairs of the company in the hands of a committee of trustees, will

not involve liquidation as was declared in a recently published statement dealing with this matter. Fred L. Sivyer, Northwestern Malleable Iron Co., chairman of the committee, states operations will be continued indefinitely under the present direction. Other members of the committee of trustees are F. W. Rogers of the South Milwaukee bank, and Thomas H. Spence, Quarles, Spence & Quarles, Milwaukee, attorneys.

Bolts, Nuts, Rivets

Consumers Keep Stocks Low But Most Contracts Are Specified

NUT AND BOLT PRICES, PAGE 1480

Chicago, Dec. 8.—Approaching inventory period and the fact that larger users have specified generously already this quarter combine to reduce bolt and nut specifications this month, but the December total promises to hold up almost to the November level. Contracting for first quarter is proceeding on a sound basis, with all prices unchanged. The advance in stove bolts has failed and the former level of 80, 10 and 5 off plus 2½ off in bulk holds over for the first quarter. Western bolt and nut works are operating at 70 to 75 per cent.

Pittsburgh, Dec. 8.—Nut and bolt customers continue to keep down inventory stocks. Specifications have been heavy and little remains unspecified on fourth quarter contracts. In the meantime, makers are closing first quarter contracts. Considerable carload business in nuts and bolts as well as rivets is noted. While on old rivet contracts the price is lower, the current market is 2.60c. The nut and bolt discount is firm at 50 and 10 off for large machine bolts.

Iron Ore

Total Movement 55,549,296 Tons—Ore To Be Shipped to St. Louis

Cleveland, Dec. 8.—Lake Superior iron ore shipments for the year 1925 are placed at 55,549,296 tons, this figure including an estimated all-rail movement of 1,468,000 tons. The lake shipping season has closed, with 7217 tons brought down in December. The total movement by the water route is 54,081,296 tons. The estimate of the all-rail shipment includes the actual tonnage moved to date, plus the amount likely to be forwarded before Jan. 1. The total 55,549,296 tons is 11,654,186 tons more than the figure for 1924, but 5,230,707 tons below that of 1923.

Receipts of iron ore at Lake Erie ports for the season to Dec. 1 totaled 38,596,823 tons, and shipments were 27,131,773 tons, leaving on dock a balance of 7,856,154 tons, compared to 8,049,276 tons on Dec. 1, 1924.

Bars

Demand Continues Heavy—Chicago Tonnage Heaviest of Year —Deliveries Delayed

SINCE mills are well sold ahead current buying necessarily is for delivery in first quarter, except for occasional gaps in rolling schedules for small lots. Chicago mills find buying in heaviest volume of the year. Tonnage booked under the present level has been well worked out and most business now is at the current level. More tonnage will be carried over than last year.

BAR PRICES, PAGE 1480

Chicago, Dec. 8.—New business in soft steel bars, now necessarily for first quarter delivery, has been heavier the past week than at any time this year. Specifications are comparably heavy, those of November having topped October by nearly 15 per cent. Increased production programs by farm implement makers next quarter are forecast by bar orders now being placed. Manufacturers of cold-drawn steel are taking record-breaking tonnages. The automobile industry is taking steel in consonance with a 4,200,000 car, or record, year. Activity in bars easily outdistances that in other finished lines, indicating a generally healthy state of industry. The market is firm at 2.10c, Chicago, and apparently the first quarter will open at that level. The carryover into the first quarter will exceed last year's.

Bar iron continues to benefit from increased freight car buying, and the market is more nearly 2.00c, Chicago. Rail steel ranges from 2.00c to 2.10c, Chicago, with one mill on double turn. Building bars are in special demand, with implement manufacturers also heavy buyers.

Boston, Dec. 8.—Bar sales are again heavy at Boston following the slump of a week ago. The price holds firm at 2.00c Pittsburgh or 2.365c delivered and first quarter inquiry is strong.

Pittsburgh, Dec. 8.—Merchant steel bar business on books of makers below 2.00c is disappearing. Some customers were able to book large tonnages at 1.90c but most of these have been delivered. Specifications are practically 100 per cent and some fairly large orders have been closed at 2.00c, deliveries extending well into the first quarter. Demand still is heavy and in many cases incoming business exceeds shipments. In some cases five to eight weeks delay is met. Bar mill operations, except for minor interruptions, are practically on a 100 per cent basis.

Demand for refined iron is increasing in connection with recent car awards. The price starts at 3.00c and up to 4.50c is quoted on certain specifications.

Cleveland, Dec. 8.—Various steel contracts for first quarter from automobile parts manufacturers in this territory hang upon the outcome of a deadlock now in progress between these manufacturers and automobile builders. The latter are insisting that parts contracts for 1926 delivery be renewed on the present basis whereas the manufacturers are holding out for advances especially in view of the recent lifting of the price of alloy steels $5 per ton. A few contracts for parts have been closed, usually on the old basis and these steel requirements are covered. Specifications from this territory with some mills are less but this is considered only the normal reflection of the season. With others, no diminution is reported. Prices are strong at 2.19c, Cleveland, or 2.00c, Pittsburgh.

Hoops and Bands

Mills Have Full Business for Remainder of Year

HOOP PRICES, PAGE 1480

Pittsburgh, Dec. 8.—All the business they possibly can take care of between now and the end of the year already is on books of hoop and band makers. They are operating narrow mills as full as possible. The price is 2.50c and fairly extensive bookings have been made at that level for first quarter although most of the material now being shipped out is on lower priced contracts.

Cold Finished Steel

Smaller Recession Than Usual For Winter Season

Pittsburgh, Dec. 8.—Reduced buying of cold-finished steel bars because of approaching inventory is not as extensive as usual. This is mainly because the automotive industry still is a large purchaser and most of the larger automobile companies take their inventories in the June-July period. Other consuming lines are active in specifying against this quarter's contracts and in signing up for next quarter on a basis which indicates tonnage about equal to this quarter's commitments. Bookings exceed shipments. The price is firm at 2.50c and operations are substantially the same as they have been, averaging 80 per cent of capacity.

Structural Shapes

Demands Continue Heavy for Season and Prospective Work Increases—Large Projects Less in Evidence—Prices Steady

ACTIVITY in the structural market continues unusually heavy, although below the average of the past few months. December is expected to bring to close the greatest year in structural steel, exceeding that of 1924. Prospects for early 1926 business are encouraging. Awards of the past week include two New York jobs taking over 4000 tons each. One Chicago interest booked about 10,000 tons in the past two weeks. Approximately 25,000 tons of structural work is pending in that district.

Although concessions still are available on attractive work, 1.90c, Pittsburgh, equivalent is the usual minimum, with 2.00c being quoted on small lots. Fabricated prices are spotty, varying with the condition of the fabricators' books.

STRUCTURAL SHAPE PRICES, PAGE 1480

New York, Dec. 8.—Structural activity is featured by placing two jobs of about 4000 tons each, with a good array of other contracts making a high total for the week. Inquiries aggregated only a fair amount, but work on architects' boards indicate an improvement shortly. Sizable shape business may still be placed at 1.90c, Pittsburgh.

Boston, Dec. 8.—Despite something of a lull in building operations, demand for structural shapes holds strong. Prices on larger tonnages have definitely advanced to 1.90c, Pittsburgh. Manufacturers and warehouses are buying for first quarter needs.

Philadelphia, Dec. 8.—While shape bookings continue heavy, prices are unchanged. Although showing firmer in some directions, the market continues 1.90c to 2.05c, base eastern mill, and 1.80c to 2.00c, Pittsburgh.

Pittsburgh, Dec. 8.—Several large shape awards took place this week but action on many more was deferred. Most local awards involve from 10 tons to 50 tons each. Inquiry keeps up surprisingly well for this season. Some mills have a 2.00c minimum on plain material. On some small orders deliveries will be extended into January. Some 1.90c protections still are out. The market is quoted at 1.90c to 2.00c.

Cleveland, Dec. 8.—Although the aggregate tonnage of structural material being placed in this territory is fair, specific jobs are few. Fabricators report a dearth of new business. Prices are firmer though, reflecting less cut throat and more sensible competition. Plain material continues steady at 1.90c to 2.00c, Pittsburgh, the maximum being more in evidence.

Detroit, Dec. 8.—Permits have been issued for the construction of 200 factories and shops in Detroit proper during the past 11 months. The estimated cost of these buildings is $8,714,859. Permits have been issued also in the same period for 71 warehouses of all kinds, costing $2,990,830.

Total construction cost in this city from Jan. 1 to Dec. 1, 1925 is estimated at $165,943,299, indicating a total of the year of approximately $175,000,000. This surpasses by approximately $15,000,000 the record established in 1924.

Chicago, Dec. 8.—Structural steel bookings in this district continue at summer instead of December level. The American Bridge Co. in particular has extended its order book, having taken well over 10,000 tons in the past two weeks in the immediate Chicago district. Three projects for which Alfred S. Alschuler, 28 East Jackson boulevard, has issued plans, total 12,500 tons. It is estimated that fully 25,000 tons of fabricating work is pending. Plain material is quoted 2.10c, Chicago.

Awards Compared

	Tons
Awards this week	38,811
Awards last week	29,432
Awards two weeks ago	19,230
Awards this week in 1924	29,968
Average weekly awards, Nov.	35,590
Average weekly awards, 1925	33,340

CONTRACTS PLACED

4450 tons, viaduct Jersey City approach to the Holland vehicular tunnel under the Hudson river, New York, to the American Bridge Co.

4219 tons, Morton building, Chicago, to American Bridge Co. Henry Ericsson Co., 139 North Clark street, Chicago, general contractor.

3500 tons, Plaut department store addition, Newark, N. J., to the Shoemaker Bridge Co.

3000 tons, power house, Detroit-Edison Co., Trenton Channel, Detroit, to the Jones & Laughlin Steel Corp.

2500 tons, Bing & Bing building, 26-40 West Fifty-fourth street, New York, to A. E. Norton, Inc.

2443 tons, Garden Courts apartments, 900 North Michigan avenue, Chicago, to American Bridge Co. J. B. French Co., 30 North Michigan avenue, Chicago, general contractor.

2100 tons, bridges for Louisville & Nashville railroad, to American Bridge Co.

1600 tons, mess hall, West Point Military academy, West Point, N. Y.; to Palmer Steel Co.

1200 tons., dispensary building, Johns Hopkins university, Baltimore, to Deitrich Bros.

980 tons, Canal street theater, New Orleans, for Syndicate, to Virginia Bridge & Iron Co.; George J. Glover Co., New Orleans, general contractor.

900 tons, Breakers hotel, West Palm Beach, Fla., to the Virginia Bridge & Iron Co.

900 tons, manufacturing building for Chrysler Motor Corp., Detroit, to Fort Pitt Bridge Works, through H. K. Ferguson Co., general contractor.

800 tons, alcohol plant at Carneys Point, N. J.; for E. I. duPont deNemours Co., to Belmont Iron Works.

800 tons, Virginia Beach hotel, Virginia Beach, Va., previously noted as placed, went to Richmond Structural Steel Co.

800 tons, academy building, Newark, N. J., to Hay Foundry & Iron Works.

750 tons, buildings for the Aluminum Co. of America, Cleveland, to the McClintic-Marshall Co.

600 tons, miscellaneous bridge work for the New York Central, to an unnamed fabricator.

543 tons, railroad swing bridge for Louisville Hydro-Electric Co., Louisville, Ky., through Byllesby Engineering & Management Corp., Chicago, to Louisville Bridge Co.

500 tons, secondary education building,, Greensburg, Pa., to J. E. Moss Iron Works through National Concrete Fireproofing Co., Cleveland.

500 tons, Mason hotel, Jacksonville, Fla., to the American Bridge Co.

400 tons, Elks club, Santa Barbara, Calif., to Union Iron Works, of Los Angeles.

400 tons, highway bridge, Cliff, Ky., to an unnamed builder.

400 to 410 tons, Broadway junior high school, Toledo, O., to American Bridge Co., through Newton Baxter Co., general contractor.

385 tons, state highway bridge, Prestonburg, Ky., to the Pittsburgh-Des Moines Steel Co.

367 tons, remodeling Shubert-Jefferson theater, St. Louis, into office building for Union Electric Light & Power Co., St. Louis, to Mississippi Valley Structural Steel Co.

330 tons, addition to Hotel Bellevue, Boston, to New England Structural Co.

325 tons, gymnasium, Gettysburg college, Gettysburg, Pa., to an unnamed fabricator.

300 tons, department store in Spartanburg, S. C., to an unnamed fabricator.

300 tons, crane runway for Inland Steel Co., Indiana Harbor, Ind., to Wisconsin Bridge & Iron Co.

300 tons, plant for California Portland Cement Co., Colton, Calif., to McClintic-Marshall Co. of California.

298 tons, bridge over Marais des Cynes river, Ottawa, Kans., to Bethlehem Steel Co.

255 tons, Piety street dock shed at New Orleans, by New Orleans port commissioners, to Stupp Bros. Bridge & Iron Co.

250 tons, bridge for the Atlantic Coast Line, to the McClintic-Marshall Co.

250 tons, St. Francis Medical building, San Francisco, to Central Iron Works.

250 tons, shapes and 150 tons of plates, loading and excavating bridges for Inspirator Copper Co., Miami, Ariz., to Union Iron Works, Los Angeles.

250 tons, smokehouse for Armour & Co., Chicago, to Hansell-Elcock Co.

246 tons, bascule span at Manitowoc, Wis., for Soo Line, to American Bridge Co.

200 tons, Waco building, 16 East Fifty-third street, New York, to Hay Foundry & Iron Works.

200 tons, Mudd-Colley-Mooney theater, Birming-

ham, Ala., to Southern Steel Works, Inc.
200 tons, plant building for the Nazareth Cement Co., Nazareth, Pa., to McClintic-Marshall Co.
160 tons, Mathew court apartment, Cambridge, Mass., to A. O. Wilson Co.
150 tons, miscellaneous work Pittsburgh area, to the W. N. Kratzer Co.
105 tons, plant for Lummis Cotton Gin Co., Columbus, Ga., to Converse Bridge & Steel Co., through H. K. Ferguson Co., general contractor.
100 tons, Goodyear Tire & Rubber Co. plant, Los Angeles, to Minneapolis Steel & Machinery Co.
100 tons, plant for Parker Bros., Salem, Mass., to Pittsburgh Bridge & Iron Works, through H. K. Ferguson Co., general contractor.

CONTRACTS PENDING

6640 tons, 28-story city hall, Los Angeles; bids being received. Possibly 12,000 tons involved if goes above height limit.
5000 tons, office building for Harry Goldstein, 160 North La Salle street, Chicago; Alfred S. Alschuler, 28 East Jackson boulevard, Chicago, architect.
4500 tons, apartment building, Chicago; Alfred S. Alschuler, 28 East Jackson boulevard, Chicago, architect.
3500 tons, Riverton bridge, McKeesport, Pa.; inquiry to be issued shortly after Jan. 1.
3500 tons, Rowland & Clark theater and office building, Penn, Liberty and Sixth avenues, Pittsburgh; planned for early 1926.
3000 tons, 21-story loft for H. H. Uris, Lafayette and Duane streets, New York; bids asked.
2400 tons, hotel on Twenty-eighth street Oakland, Calif.; bids opened.
2000 tons, New York Central bridge, Erie, Pa.; bids asked.
2000 tons, apartment, Fifty-sixth street and Park avenue, New York; pending.
2000 tons, new Parker house hotel, Boston, preliminary figures taken. Old building being torn down.
1700 tons, United Gas Improvement Co. building, Philadelphia; Murphy & Quigley Co., awarded general contract.
1700 tons, Louisiana Railway & Navigation Co. bridge over Atchafalaya river, Simmesport, La.; bids in.
1200 tons, Winthrop hotel, Boston; bids being taken. General contract let.
1120 tons, Maccabees' building, Detroit; pending.
1100 tons, theater and office building, Eleventh and Hill streets, Los Angeles, for E. L. Doheny; bids will be taken soon.
1000 tons, Pere Marquette hotel, Peoria, Ill.; Hewitt & Emerson, Peoria, architects.
750 tons, packing plant for California Packing Corp., Miami, H. T.; bids being received.
700 tons, interstate bridge across Delaware river; pending.
700 to 1000 tons, McCrory Stores, St. Louis, to Mississippi Valley Structural Steel Co.
600 tons, Hawaiian Electric Co. building, Honolulu; bids received.
600 tons, Jewish synagogue, Hobart and Wilshire boulevard, Los Angeles; bids Dec. 15.
600 tons, theater for Warner Bros., Wilcox and Hollywood boulevard, Los Angeles; bids about Dec. 31.
550 tons, Coplin Bros. building, Buffalo; bids now in hands of builders.
500 tons, Henry Clay Frick training school for teachers, Pittsburgh; bids in.
500 tons, Dilworth school, Pittsburgh; bids being taken by board of education until Dec. 17.
400 tons, transit shed, berth 230 A B, Los Angeles harbor; bids Dec. 16.
400 tons, Flynn & Emerich foundry, Baltimore; bids asked.
400 tons, addition to the New York Curb exchange, Trinity place, New York; pending.
300 tons, 9-story apartment for the Leftcourt interests, 42-46 West Forty-eighth street, New York; bids asked.
300 tons, city hall, Pasadena, Calif.; bids Jan. 4.
300 tons, Pennsylvania railroad bridge, Altoona, Pa.; pending.
300 tons, George Innes high school, Montclair, N. J.; pending.
230tons, St. Ann's school, 110th street, New York; pending.
207 tons, Lacy apartments, San Francisco; pending.
200 tons, school, Crockett, Calif.; bids being taken.
125 tons, plant in Milwaukee, for International Harvester Co.; the Austin Co., general contractor.
117 tons, Elmhurst school, Oakland, Calif.; bids being taken.
116 tons, Golden State theater, San Francisco; bids being received.
100 tons, bank, Long Branch, N. J.; pending.
100 tons, Peoples National Bank & Trust Co., Lynn Brook, Long Island, N. Y.; pending.

Concrete Bars

Lessened Buyers' Interest Is General—Inquiries Are Fewer

DIMINISHING orders for concrete bars are meeting the efforts of mills and fabricators to get business. Inquiries and orders are fewer. Featuring awards of the week were the 1400-ton railroad terminal at Fredericksburg, Va., and a sewer system in Philadelphia taking 600 tons. Bar quotations show little change and generally are firm.

REINFORCING BAR PRICES, PAGE 1480

Chicago, Dec. 8.—Pending work in reinforced concrete has increased noticeably in the past few days and the volume of work outstanding is unprecedented for the season. November shipments of bars were heavy. Most new projects involve good-sized tonnages and the average of bars per inquiry has increased. Warehouses are letting their stocks of bars drop to a low point as inventory time approaches. The market on billet bars is firm at 2.60c, Chicago warehouse, with rail steel bars at 2.00c to 2.10c, Chicago.

Pittsburgh, Dec. 8.—Concrete bar awards again have been of small proportions this past week. Larger projects still are deferred and some attractive lots are scheduled for letting this week. The price still is 2.00c to 2.10c although little has been done at the maximum figure.

Buffalo, Dec. 8.—Large projects still outstanding involve nearly 1000 tons of concrete bars but sales have been small. Builders are not buying much ahead of their needs and are slow to close for their requirements. The price on mill shipment lots is 2.265c, Buffalo.

Cleveland, Dec. 8.—Local concrete bar sellers are restricted to small tonnage bookings. Several good sized jobs are being figured but action is delayed. December is expected to be a dull month. New billet bars are quoted 2.19c to 2.25c, Cleveland, although as high as 2.30c has been done on small lots. Rail steel is priced 1.80c to 2.00c, mill.

Boston, Dec. 8.—Sales of the past week have been light, but new work for award after the first of the year is appearing in large volume and prices hold firm at 2.00c Pittsburgh or 2.365c delivered. The Boston warehouse price is 3.05c.

Awards Compared

	Tons
Awards this week	3,740
Awards last week	3,832
Awards two weeks ago	4,535
Awards this week in 1924	2,275
Average weekly awards, Nov.	4,383
Average weekly awards, 1925	6,059

CONTRACTS PLACED

1400 tons, bridge and terminal, Fredericksburg, Va., for Richmond, Fredericksburg & Potomac railroad, to Kalman Steel Co.; Whiting Turner Construction Co., general contractor.
600 tons, Wingohocking sewer, Philadelphia, to Kalman Steel Co.; Whiting Turner Construction Co. general contractor.
400 tons, Wolford hotel, Danville, Ill., to Olney J. Dean & Co.; Yeager & Son, Danville, general contractor.
400 tons, Fairfax hotel, Chicago, to Calumet Steel Co.; John A. Lundstrom, Chicago, general contractor.
300 tons, Paradise theater, Chicago, to Concrete Engineering Co.
200 tons, Gilmore Drug Co., Pittsburgh, warehouse, to the Electric Welding Co.
175 tons, plant for Selby Shoe Co., Ironton, O., to Pollak Steel Co., H. K. Ferguson Co., Cleveland, general contractor.
135 tons, secondary educational building, Greensburg, Pa., to Truscon Steel Co., through National Concrete Fireproofing Co., Cleveland.
130 tons, Eitel apartment hotel, Chicago, to Inland Steel Co.; Louis Guenzel, 879 North State street, Chicago, architect.

CONTRACTS PENDING

350 tons, Morton building, Chicago; Henry Ericsson Co., 139 North Clark street, Chicago, general contractor.
250 tons, Fourth avenue garage, Pittsburgh; figured twice before, now up for third bids.
150 tons, Amakomy bulding, Memphis, Tenn.; pending.
150 tons, Coplin Bros. building, Buffalo; bids now in hands of builders.
100 tons, Henry Clay Frick Training school for teachers, Pittsburgh; bids close late this months.
100 tons, Dilworth school, Pittsburgh: bids close Dec. 17.
100 tons, Hendrey house, Evanston, Ill.; Charles B. Johnson & Son, 111 West Washington street, Chicago, general contractor.
Tonnage unstated, 8-story apartment building, Evanston, Ill. Paschen Bros., 111 West Washington street, Chicago, general contractor.
Tonnage unstated, 12-story club house at Sheridan road and Ardmore street, Chicago; plans by Paul Gerhardt, 64 West Randolph street, Chicago.
Tonnage unstated, New Breakers hotel, Palm Beach, Fla.; general contract to Turner Construction Co.

A petition in bankruptcy has been filed against the Richardson Oil Burner Corp., Brooklyn, N. Y.

Rails, Cars

Interest in Rolling Stock More Active—November Car Awards Largest of Year

FEATURED by the placing of 2000 cars by the Wabash and inquiry by the Union Pacific for 2000, the railroad equipment market shows fair activity. November car awards were the heaviest of the year, but 1925 will be the lightest year since 1921. Locomotive buying includes 45 by the Atlantic Coast Line, and 50 by Seaboard and 25 by the Frisco systems.

RAILROAD TRACK MATERIAL PRICES, PAGE 1480

New York, Dec. 8—Domestic freight car awards in November, according to full returns, were 11,686. This compares with 11,145 in October and brings the total for the first 11 months up to 60,225 cars. From all present indications buying during the present year will be by far the lightest since 1921, when 22,050 were awarded.

Following is a comparative statement:

November	11,685
October	11,145
September	7,905
August	2,875
July	800
June	1,835
May	6,985
April	5,060
March	4,730
February	5,510
January, 1925	1,695
1923 total	103,487
1924 total	144,425

Current activity is featured by the placing of 2000 cars for the Wabash and by an inquiry for 2100 freight cars for the Union Pacific.

Featuring locomotive awards are lettings of 25 by the St. Louis-San Francisco and 50 by the Seaboard Air Line to the Baldwin Locomotive Works. This company also booked three switch engines for the Porto Rico and one Mallet engine for the United railway. The Lima Locomotive Works, Inc., has booked two for the Atlanta & West Point. Locomotive inquiries include 25 for the Union Pacific, and five for the Western Pacific. The New York Central has purchased 10 electric locomotives. Atlantic Coast Line has closed on 45 locomotives.

Boston, Dec. 8.—Heavy buying of rails and rail material is imminent in New England. Inquiry includes $250,000 worth of frog and switch material. The Central Vermont railroad wants 8000 tons of rails, and nearly all other roads either have placed or are on the point of placing 1926 rail tonnage. The Boston Elevated bought 2000 wheels and other material during the week.

Pittsburgh, Dec. 8.—While the majority of billet-rolled light rail sellers quote a gross ton basis, some buyers still inquire for prices on the pound basis and are quoted from 1.60c up. The gross ton price is $36 to $38, depending upon the competition encountered. The aggregate tonnage is mounting upward week by week.

Chicago, Dec. 8.—Track fastening bookings here last week were the heaviest of any week this year principally because of the New York Central award. Its inquiry was for 3,000,000 to 5,000,000 tie plates and 25,000 to 45,000 kegs of spikes. Rail tonnage placed on books aggregated a good total but largely included previous sales.

The Wabash has placed its 2000 automobile cars with western makers. Inquiry by the Chicago, Milwaukee & St. Paul for car repairs totals 15,000 tons. Car inquiries from the Chicago & North Western and Southern Pacific are looked for early next year.

Cleveland, Dec. 8.—Definite inquiries for 20,000 tons of rails for the Nickel Plate and related roads are out and distribution is expected shortly. These rails are for the Nickel Plate proper, the Clover Leaf and the Lake Erie & Western.

ORDERS PLACED

Erie, 100 coaches and 18 express cars, to Standard Steel Car Co.
National Tube Co., 50 hopper bodies, to Greenville Steel Car Co.
Palace Poultry Car Co., 50 refrigerator cars, to the Illinois Car & Mfg. Co.
Southern railways, 100 caboose cars, to Lenoir Car Works.
Wabash, 2000 automobile box as follows: 1000 to American Car & Foundry Co., 700 to Standard Car Co. and 300 to Streator Car Co.
Norfolk & Western, 43 coaches, to Bethlehem Steel Co.
Rochester & Pittsburgh Coal & Iron Co., 500 mine cars, 250 each to American Car & Foundry Co. and Bethlehem Steel Co.

ORDERS PENDING

Mobile & Ohio, 500 automobile box cars and 10 coaches; pending.
Pittsburgh & West Virginia, 1000 gondolas noted last week include, 700 50-ton steel gondolas and 300 55-ton composite gondolas; pending.
Union Pacific, 2000 freight and 47 miscellaneous, 1000 ballast, 1000 automobile, 15 coaches, 10 baggage cars, 10 observation cars, 5 horse cars, 5 diners and 2 postal.
Lackawana, 40 milk cars; inquiry formally out.

Wire

Current Buying Slack But Heavy Tonnages Expected to Come Soon

BUYING of wire and wire products is principally for current needs, from manufacturers and consumers, jobbers waiting for the turn of the year. Protection for 60 days at present prices has been granted and heavy buying is expected to follow the end of the year. Jobber stocks are low. Prices are steady and unchanged at former levels.

WIRE PRICES, PAGE 1480

Pittsburgh, Dec. 8.—Wire jobbers are as usual being protected for 60 days at present levels, to Feb. 1. Base prices are 2.50c for plain wire and 2.65c for wire nails. Specifications are being withheld to prevent undue increases to inventory stocks but are promised immediately after the holidays. Occasionally a mixed carload is needed and some single carloads of nails are bought by large users, including the lumber industry and automotive manufacturers. Manufacturers' wire specifications are coming in regularly, enabling mills to operate around 60 per cent. Fencing demand is lacking but it is expected to involve large tonnages for the spring trade.

Boston, Dec. 8.—First quarter wire volume than a year ago, and shipcontracts have been entered in larger ments are heavy. Nail demand shows improvement. Plain wire holds firm at 2.65c Worcester.

Chicago, Dec. 8.—Despite the approach of inventory consumers of wire and wire products are taking an increasing tonnage. Demand from manufacturing lines continues relatively better than that for jobbing lines. Both mill and jobber stocks of common products are the lowest in many months. Western wire mills are maintaining about 70 to 75 per cent operation. Talk persists of an advance over 2.55c, Chicago or western mill, for plain wire and 2.70c for wire nails, but no immediate action is in sight.

Struthers To Operate

Youngstown, O., Dec. 8.—Operation of the Struthers Furnace Co.'s blast furnace was permitted by Judge J. H. C. Lyon in a decision handed down Monday on the petition of Receiver H. W. Grant to give such grant. The receiver must finance operation some way other than issuing certificates or under the court's permission may lease the property for operation. The bond holders who strenuously objected to operation asked for a new trial.

It is understood that Mr. Grant has an offer to lease the furnace to a furnace operator in this district at an outright rental plus a royalty on each ton of pig iron produced and that he will close a contract shortly.

Nonferrous Metals

Prices Continue to Exhibit Weakness With Domestic Consumers Fairly Well Covered and Export Business at a Standstill

Prices of the Week, Cents a Pound

	Copper, Electro delivered	Copper, Lake delivered	Copper, Casting refinery	Spot Straits Tin, N. Y.	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
	Cents per pound									
Dec. 2	14.12½	14.37½	13.60	63.25	9.50	9.35	8.45	28.00	20.25	34.00
Dec. 3	14.00	14.25	13.50	63.00	9.50	9.35	8.50	28.00	20.25	34.00
Dec. 4	14.05	14.25	13.60	63.62½	9.50	9.35	8.60	28.00	20.25	34.00
Dec. 7	14.10	14.25	13.50	64.00	9.50	9.35	8.80	28.00	20.25	34.00
Dec. 8	14.05	14.25	13.40	63.50	9.25	9.15	8.75	28.00	20.25	34.00

NEW YORK, Dec. 8.—Prices of non-ferrous metals fell considerably during the past week despite continued prosperity in practically all classes of manufacturing. In the past day or two much of the loss was recovered, and then hesitation appeared again. Lack of export business was one of the big factors in irregularity. Domestic users are better covered on near-by requirements than they were early in the fall.

It is interesting to note that early last January copper, zinc, lead and tin ran into weak markets, while iron and steel markets still were strong. All metals except copper still are selling at higher prices than a year ago. Shipments of all metals to domestic users continue large and stocks of metals in producers' hands remain light.

Zinc—Prime western again has recovered sharply after a break. It sold down to a little under 8.50c, E. St. Louis, several days ago and then recovered to 8.80c. During the recession prompt shipment commanded a premium, but now December has come up to prompt, and both are difficult to obtain. In fact, it is reported some operators are buying from others in order to meet specifications. On the other hand, users are fairly well covered now for December, and are not greatly interested further ahead. However, some metal has been sold for January and a little beyond. On account of high operations smelters are anxious for a backlog and are ordering futures at concessions, but will not go down more than five or 10 points a month on account of the ore market.

Tin—Spot is in an unusually strong position, in fact almost impossible to obtain, but futures are easy on account of larger shipments from the Orient. The spread between the two positions is at least one cent and sometimes lately one-fourth cent more. The visible supply of tin is larger than in the past few months, but still it is much less than it frequently has been. Use has continued at such a large and steady pace that output, even stimulated by high prices, appears no more than to keep pace.

Copper—In the past few weeks the price of the red metal has fallen from a little under 15c to 14c delivered, Connecticut. At the lower level a number of users decided they could not remain out of the market longer, with the result buying in the past few days caused a recovery to 14.12½c, then the London market eased and the market here became quiet and a little uncertain, between 14 and 14.12½c. The market needs more support from abroad in order to be consistently strong. There is no doubt that domestic consumption will continue at a tremendous rate for at least the greater part of the winter.

Lead—This metal has been alternately easy and firm in the past few days, depending largely on the fluctuations in London. The market abroad has not demanded all of the Canadian and Mexican supply lately, with a result that a little more metal is available here. The open market has been on a par lately with the leading interest at 9.50c, New York, and today was cut to 9.25c when the American Smelting & Refining Co. cut to that figure.

Aluminum—Users appear to be well covered for the first quarter and prices are steady.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	19.37½
Copper, hot rolled	22.75
Zinc, ga. 9 to 17	12.00
Lead full sheets (cut ¼c more)	13.50 to 14.00
Aluminum, bright flat, up to 10 gage	37.50
SEAMLESS TUBES	
High brass	24.00
Copper	24.75
RODS	
High brass (round ⅝ to 2½-inch)	17.12½
Naval brass	19.87½
WIRE	
Copper	15.75 to 16.00
High brass	19.75

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	8.75
Chicago	9.50 to 9.75
Cleveland	9.50 to 9.75
HEAVY YELLOW BRASS	
New York	6.75
Chicago	8.00 to 8.25
Cleveland	7.75 to 8.00
ZINC	
New York	5.25
Cleveland	4.50 to 4.75
HEAVY COPPER AND WIRE	
New York	11.50
Chicago	11.50 to 12.00
Cleveland	11.25 to 11.50
RED BRASS BORINGS	
New York	8.00
YELLOW BRASS TUBING	
Cleveland	7.75 to 8.00
LIGHT COPPER	
New York	9.50
Chicago	9.75 to 10.25
Cleveland	10.00 to 10.50
LIGHT BRASS	
Chicago	7.25 to 7.50
Cleveland	6.25 to 6.50
ALUMINUM	
Borings, Cleveland	15.00 to 16.00
Remelt aluminum No. 12	25.00 to 26.00
Brass ingot 85-5-5-5	11.50 to 12.00

Secondary Metals

Remelt aluminum No. 12	25.00 to 26.00
Brass ingot 85-5-5-5	11.50 to 12.00

Coke By-Products

Demand for Distillates Active—Prices Firm—Sulphate Steady

New York, Dec. 8.—Buying of light oil distillates continues active. Paint and lacquer interests are buying heavily of toluol and solvent naphtha, while the rubber manufacturers in particular are closing on good quantities of benzol. Following the recent sharp advance in toluol and solvent naphtha distillates have remained unchanged. Pure and 90 per cent benzol are on the same basis, with prices holding at 24 cents a gallon in tanks and 29 cents in drums. Toluol and solvent naphtha are quoted at 35 cents a gallon in tanks and 40 cents in drums,

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contract
Pure benzol	$0.24	
Toluol	0.35	
Solvent naphtha	0.35	(nominal)
Commercial xylol	0.36	(nominal)
Phenol	0.22	0.22
Per Pound at Producers' Plants		
Naphthalene flakes	0.05½ to 0.06½	0.06 to 0.07
Naphthalene balls	0.06½ to 0.07½	0.07 to 0.08
Per 100 Pounds Delivered		
Sulphate of ammonia	$2.82½	

and commercial xylol at 36 cents in tanks and 41 cents in drums.

Steadiness prevails in naphthalene notwithstanding that business is affected by dull seasonal influences. Spot flakes are quoted at 5½ to 6½ cents and balls at 6½ to 7½ cents, with prices on future shipments about ½ cent higher. Phenol is quoted 22 cents, works.

Sulphate of ammonia is in fair demand with spot prices around $2.80 to $2.85, delivered, for domestic account, and $2.70, port, for material in double bags for export.

Coast Business Better

Southern California Finds Unusual Demand for Winter—
Prospects Good for Further Buying

LOS ANGELES, Dec. 3.—(*By Air Mail*)—General business conditions in the southern part of California are of pleasing character for this time of the year. Recent advances in mill prices have stimulated buying in this section and in certain lines some rather heavy tonnages have been booked. Stocks generally are well rounded out.

Pig Iron and Coke

Foundry operations around Los Angeles are more active than elsewhere on the Pacific Coast but sales of pig iron and coke have involved few large tonnages recently as stocks in foundry yards are ample for present requirements. A firmer tone is noted in prices of iron and current quotations are as follows:

Coast Pig Iron Prices

Columbia basic, San Francisco	$27.00 to 28.00
No. 2 Columbia, San Francisco	27.00 to 28.00
No. 2 Columbia, Los Angeles	27.00 to 28.00
No. 2 Columbia, Portland	27.50 to 28.50
No. 2 Columbia, Seattle	27.50 to 28.50
*Dutch	24.50 to 25.00
*Indian iron	24.00
*Belgian	25.00 to 25.50
*English (2.75-3.75 sil.)	26.50 to 27.00
*German	25.50 to 26.00

*C.i.f. duty paid.

The Southern Pacific Co., has taken no action, as yet, on its inquiry for 500 tons of foundry coke.

Bars, Plates and Shapes

Included among the larger tonnages of reinforcing bars pending in this district is 350 tons for a bridge across the Los Angeles flood control channel at Long Beach. As is the case in other sections up and down the coast the bulk of the present bar business is made up of small tonnages ranging from 30 to 70 tons. Out-of-stock prices in Los Angeles and San Francisco are by no means firm. In San Francisco this week 3.10c f.o.b. warehouse has been quoted on small lots and rumors persist regarding a 2.85c price. In Los Angeles a good deal of business is reported having been placed around 2.50c on car lots.

Pending plate business is of heavy proportions and over 10,000 tons is involved. The Pacific Coast Engineering Co. took 200 tons for a barge for Libby, McNeill & Libby for shipment to Hawaii and Moore Dry Dock Co. was low bidders on two ferry boats for the Key System Transit calling for 2000 tons. Most producers are holding to the level named last week, 2.30c c.i.f. but it is reported some business was quoted on this week at 2.20c.

The structural shape market is active and awards this week aggregated 2000 tons. The Union Iron Works of Los Angeles took 400 tons for the Elks Club at Santa Barbara and 400 tons for loading and excavating bridges for the Inspiration Copper Co. in Arizona, while McClintic-Marshall Co. took 300 tons for a plant for the Calif. Portland Cement Co. at Colton, Calif. Pending business totals over 12,000 tons, a new 28-story City Hall for Los Angeles calling for at least 6640 tons and possibly 12,000 tons if it exceeds the present height limit. It is planned to pass a special ordinance permitting the structure to exceed the present 12-story limit. Prices appear firm at the new levels, 2.35c c.i.f. on large lots and 2.40c on the usual run.

Other Finished Material

Little sheet buying is being done in this district, due to consumers covering at the old prices. It is reported that at least 10,000 tons was recently booked. First quarter prices are firm at 4.60c, 3.35c and 2.50c base Pittsburgh on galvanized, black and blue annealed sheets respectively. The Standard Oil Co. has placed 175,000 base boxes of tin plate.

The Southern Pacific Co. has just closed on 2000 tons of girder rails. No other inquiries of importance are up for figures at present.

Los Angeles placed 1375 tons of cast iron pipe with the American Cast Iron Pipe Co. and 405 tons with Grinnel Co. who will supply Belgian material. No other awards of importance were reported. Pending business totals 5000 tons.

Northwest Buying Holds

SEATTLE, Dec. 2.—The market is showing firming tendencies in this section although buying is on a limited scale. Inventory time is at hand and the trade is restricting its purchases. Latest federal census figures show that in the state of Washington foundry and machine shop products rank second of the ten leading industries of the state with an annual output of more than $40,000,000, the state's total being more than $594,000,000.

Reduction of iron and steel rates by water on the intercoastal route two weeks ago has not unsettled prices. As a matter of fact prices have since been advanced on structurals and plates and the tendency of that market is firm. With rates cut by the conference lines from 40 cents to 30 cents per 100 pounds, one non-conference line was reported to be quoting 25 cents and others not in the conference were working on a 28½-cent base. The westbound freight berth has been unsettled by extra steam tonnage sent to the Atlantic with lumber. These vessels created strong competition in seeking cargo on their return to the Pacific.

Pig Iron and Coke

The foundry trade reports less activity and probably less than half the total capacity in this district is operating. No improvement is expected within 60 days. The plants are not interested in purchasing iron at this time as they are well supplied as a rule. Columbia iron from Utah is selling about $20.50 base furnace, a recent reduction of 50 cents, which places it about on a competitive basis with some grades of imported material. Some of the larger consumers have just placed a large order for Tyneside coke February delivery here. This material is being quoted at $14 f.o.b. plant here.

Bars, Plates and Shapes

Conditions in the bar market are unchanged, the local mill still quoting 2.35c. Business continues steady and is possibly a trifle more active than usual at this season. Two open-hearth furnaces are operating. Jobbers' prices of bars are also unchanged. No large bar contracts are pending, new business being largely confined to small tonnages.

Mill prices of plates and structural steel are reported at 2.30c and 2.35c respectively, these quotations being an advance of $1 per ton over a fortnight ago. This increase has been made effective despite the quiet holiday season and the decline of intercoastal freights on iron and steel.

The largest plate job pending here involves about 600 tons for a water pipe job at Everett, Wash. Bids are to be opened Dec. 5, having been postponed from Dec. 1. This is known as the Flowing Lake project and includes 15,000 feet of 28-inch steel pipe.

Two contracts for structurals have been pending for several weeks. One involving 150 tons for an addition to the state hospital at Steilacoom has been postponed because of a lack of funds. The other is 110 tons for a storehouse at the Puget Sound navy yard for which W. A. Parker has the general contract.

Opening of bids for constructing the Vantage Ferry bridge for the state highway commission, originally set for Dec. 1, has been deferred to Jan. 5 to give bidders more time to figure. This job involves more than 1500 tons of structural steel. The Bridge of the Gods to be erected on the Columbia river, 1600 tons, is to be awarded soon.

Britain Is Shipping Coal to U. S.

Thirty-five Thousand Tons of Anthracite Forwarded—More Pig Iron Also Sent to American Users—English Firm Books 23,000 Tons of Rails for Egyptian Railroad

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Dec. 8.—(*By Radio*)—Thirty-five thousand tons of anthracite coal have been shipped to the United States from British mines, since it was reported Nov. 17 that vessel tonnage had been engaged to carry coke and coal.

Further shipments of pig iron to American consumers from Middlesbrough also are noted. The total amount of pig iron exports from that district during the month of November is 21,763 tons most of which went to three countries, the United States, Italy and Belgium.

British pig iron prices are strengthening while steel is easier. Continental competition in steel has been checked owing to prolonged deliveries. The British firm of Bolckow, Vaughan & Co. has taken an order for 23,000 tons of rails for an Egyptian railroad.

The sheet market is satisfactory; and tin plate is strengthening.

A report from Paris states French steel mills are booked through February, and prices are stiffening. Berlin reports steel sales to India. The Belgian market is firm. Exports from Czecho-Slovakia are increasing.

British Steel Improvement Real, Though Slight

BIRMINGHAM, Eng., Nov. 27.—(*European Staff Service*)—The revival in the steel trade has been severely tested. Owners of new plants are anxious to take the earliest opportunity to obtain some return on their expenditure, and a keen fight has started for every ton of business available. The natural effect of this is some easier prices for several products. Yet, with profits reduced to almost microscopic dimensions, an order has been lost this week to Germany representing about 5000 tons of steel. This is a roofing undertaking for the Oudl and Rohilchand railway of India supposed to be worth roundly £84,000. The business

Sterling $4.84

was well worth having, and engineers quoted on the lowest possible basis to get the contract.

Among the occasional successes is the securing by the Darlington Forge Ltd. of Durham, of an order for heavy forgings for the Synthetic Ammonia & Nitrates Co. of Billingham. The forgings are said to be unusually large, and the value of the contract it put at £100,000. The Egyptian State railways have issued specifications for 1000 open low-side wagons of 10-ton carrying capacity. Some good business in rolling stock has been placed by the London Underground railways, whose schemes of extension should be maturing shortly. In the meantime, the mills have nothing like the business necessary to keep them moderately employed.

Pig iron is most hopeful so far, with increased home orders and expanding continental business. Stocks on the east and west coasts have now practically disappeared and output is expanding. Two additional furnaces owned by the Linthorpe and Ayrsome companies are expected to restart shortly.

(*Concluded on Page* 1510)

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, December 7	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON	£ s d			Francs		Francs	£ s d	
Foundry No. 3, Silicon 2.50-3.00	$16.25	3 7 0*	$14.21	370	$14.30	315	$16.98	3 10 0
Basic	15.76	3 5 0	14.88	385	14.76	325	15.04	3 2 0
Basic-bessemer	18.67	3 17 0†	14.02	365	14.30	315	16.98	3 10 0
Hematite, Phosphorus 0.02-0.05	18.19	3 15 0	18.62	485	.....	...	19.40	4 0 0
SEMIFINISHED STEEL								
Billets	$26.68	5 10 0	$20.93	545	$21.11	465	$26.68	5 10 0
Wire rods	44.86	9 5 0	27.26	710	27.92	615	29.10	6 0 0
FINISHED STEEL								
Standard rails	$35.16	7 5 0	$27.26	710	$29.06	640	$31.53	6 10 0
Merchant bars	1.52c	7 0 0	1.13c	650	1.15c	560	1.17c	5 6 0
Structural shapes	1.35c	6 5 0	1.05c	605	1.07c	520	1.18c	5 7 0
Plates, ship, bridge and tank	1.54c	7 2 6	1.18c	680	1.22c	590	1.38c	6 5 0
Sheets, black, 24 gage	2.22c	10 5 0	2.19c	1,260	2.25c	1,090	1.64c	12 0 0
Sheets, galvanized, 24 gage, corrugated	3.60c	16 12 6	3.00c	1,725	4.53c	2,200	3.69c	16 15 0
Bands and strips	2.22c	10 5 0	1.39c	800	1.47c	715	1.63c	7 8 0
Plain wire, base	2.38c	11 0 0	1.74c	1,000	1.75c	850	1.60c	7 5 0
Galvanized wire, base	3.03c	14 0 0	2.35c	1,350	2.27c	1,100	1.98c	9 0 0
Wire nails, base	3.14c	14 10 0	1.74c	1,000	1.76c	855	2.20c	10 0 0
Tin plate, base box 108 pounds	$ 4.85	1 0 0	.....	...	.....	...	$ 6.55	1 7 0
Domestic Prices at Works or Furnace—Last Reported								Renten Marks
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$16.01	3 6 0	$13.25	345(2)	$14.30	315	$19.55	85
Basic pig iron	15.76	3 5 0	13.25	345(1)	14.30	315	20.24	88
Furnace coke	3.15	0 13 0	5.49	143	5.68	125	5.18	22.50
Billets	26.68	5 10 0	18.62	485	21.11	465	27.37	119
Standard rails	1.73c	8 0 0	1.00c	575	1.18c	575	1.48c	142
Merchant bars	1.62c	7 10 0	1.02c	585	2.21c	585	1.36c	130
Shapes	1.43c	6 12 6	1.00c	550	1.16c	565	1.37c	131
Plates, ship, bridge and tank	1.57c	7 5 0	1.20c	690	1.35c	655	1.48c	142
Sheets, black, 24 gage	2.27c	10 10 0	2.09c	1,200	2.27c	1,100	2.35c	225
Sheets, galvanized, 24 gage, corrugated	3.60c	16 12 6	2.96c	1,700	4 58c	2,225	3.55c	340
Plain wire	2.38c	11 0 0	1.65c	950	1.75c	850	1.56c	150
Bands and Strips	2.22c	10 5 0	1.40c	745	1.49c	725	1.62c	155

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 6d ($3.27) f. o. b. Ferromanganese £15 5s 0d ($73.96) f. o. b. German ferromanganese £14 0s 0d ($67.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg and German are for basic bessemer steel.

Machinery

December Buying Starts Off Well Although Below November Volume—1925 To Be Best Year Since War

MACHINE tool purchases continue to hold up well despite the fact that plant appropriations are exhausted in many cases and buying must be put over until the first of the year when new funds are available. Budgets now are being prepared. Some of the tendency to delay purchases also is assigned to the approaching inventory period. With the exception of purchases which are now being made by the Norfolk & Western railroad, the bulk of orders is from industrial interests. As a rule sales are for small lots, usually one to four machines. Deliveries continue to recede and prices stiffen, in the case of one line of milling machines advances of 5 per cent were put into effect Dec. 5. Used machinery is in good demand.

New York, Dec. 8.—Norfolk & Western has commenced to buy on its large list, closing on at least 20 miscellaneous machines. Orders otherwise are mostly for industrial account. Included are two 6-foot radial drills for Ingersoll-Rand Co., this city; 36-inch engine lathe for the McKinney Steel Co., Cleveland; 2500-pound steam hammer for Charles E. Larson & Son, Chicago; and a 4000-pound steam hammer for the Canadian National railway, all going to the Niles-Bement-Pond Co. Morse Twist Drill & Machine Co., New Bedford, Mass., has purchased four automatic lathes; Wildman Mfg. Co., Norristown, Pa., two profiling machines; Westinghouse Electric & Mfg. Co., an 8-inch rotary surface grinder; and North East Electric Co., Rochester, N. Y., on a duplex thread hobbing machine, these orders going to the Pratt & Whitney Mfg. Co. Astoria Light, Heat & Power Co., Astoria, L. I. has closed on a bending brake. Jersey Central is inquiring for a shaper for Elizabethport, N. J. Cranes continue to move slowly.

Boston, Dec. 8—While the approach of the holiday season is affecting local sales, New England machine tool manufacturers report the national demand holding up well with inquiry in volume sufficient to indicate continued activity well into 1926. Many of the important toolmakers in the district report total sales for 1925 ahead of either 1924 or 1923. Grinding tool manufacturers have experienced a particularly large volume of business during the past three or four months.

Sales of the past week include a radial drill to a textile machine manufacturer, a large lathe to a printing machine manufacturer, and four tools to a drop forge plant. Boston & Albany railroad is inquiring for a lathe. A textile machine manufacturer is inquiring for several tools. General Electric Co. wants a grinding machine and some other equipment for its Massachusetts plants.

Pittsburgh, Dec. 8.—Distribution of machine tool orders on the Norfolk & Western railroad's recent large list has started. Several sellers have shared in the distribution and others are expecting awards this week. Somers, Fitler & Todd Co., large machinery and supply house here, reports signal success in the disposition at various times during the past month or two of punch and shear equipment, two motor-driven punches and shears being sold to two out-of-town manufacturers again this past week. Several dealers report sales this month are far below November's rate, but are confident concerning the first quarter of next year. While the inquiry rate is increasing, the general tendency seems to be to postpone buying until after the holidays. The same thing is true of cranes. Only one small crane order is noted in this district this past week but the Carnegie Steel Co. and others who are inquiring are expected to order soon.

CRANE ORDERS PLACED

Five 5-ton 3-motor cranes for National Plate Glass Co., Ottawa; to Whiting Corp.

Two 3-ton electric cranes for West Philadelphia plant of General Electric Co.; to Whiting Corp.

Two 5-ton electric cranes for American Cast Iron Pipe Co., Birmingham, Ala.; to Niles-Bement-Pond Co.

Two 3-motor cranes, one 3-ton and one 15-ton, for Tarrant Foundry Co.; Chicago.

Two ditchers for Chesapeake & Ohio railroad; to American Hoist & Derrick Co.

Two 20-ton used locomotive cranes for Pelham & Knight Co., Inc., Maigs, Ga.; to Philip T. King, New York.

Among single orders were: 7½-ton handpower crane for N. P. Nelson Iron Works, Passaic, N. J., to Alfred Box & Co.; 30-ton locomotive crane for Central Railroad of New Jersey to Ohio Locomotive Crane Co.; 5-ton handpower crane for Uniontown, Pa., plant of Richmond Radiator Co., to Whiting Corp.; 7-ton handpower crane for Chesapeake Corp., West Point, Va., to Niles-Bement-Pond Co.; 25-ton locomotive crane for McFeeley Co., Hoboken, N. J., to Browning Crane Co.; small scrap crane for Levinson Iron Co., Pittsburgh, to Shepard Electric Crane & Hoist Co.

CRANE ORDERS PENDING

Five cranes, including three 3 1/3 ton, one 10-ton and one 15-ton, for Koppers Co., Pittsburgh, for installation at a western point; bids being compiled.

Group inquiries being worked upon include those of Carnegie Steel Co. and other units of United States Steel Corp.; Weirton Steel Co.; and one or two other independent steel interests.

One 4 or 5-ton traveling crane and two derricks for Peerless Trading & Supply Co., Brooklyn; inquiry issued.

One used mechanical shovel wanted by Dolese Bros. Co., Chicago.

One caterpiller tractor, gas crane, ¾-yard clamshell bucket and drag line; inquiry issued.

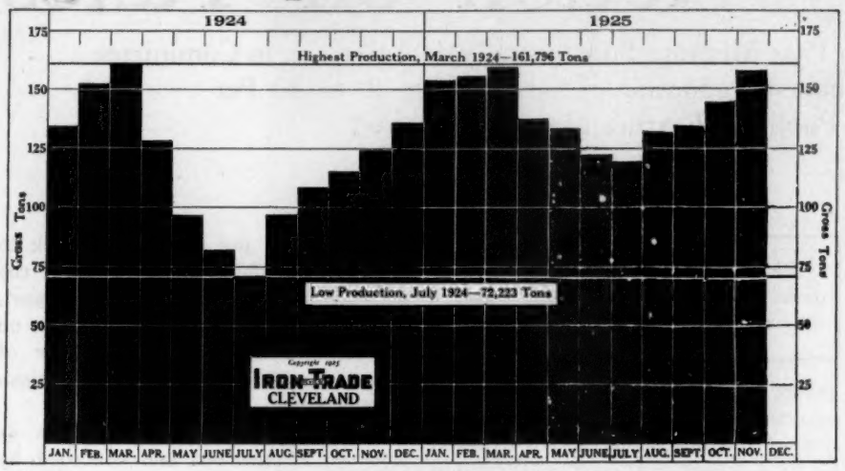
Chicago, Dec. 8.—The machinery market has extricated itself from the pocket into which it fell in the first week of December and sales the past few days have been up to the November average. This year's business will total higher than the week-to-week business would indicate. One large machinery house did more business in November than in any month since 1923. Deliveries continue to fall back. Prices on milling machines were advanced 5 per cent Dec. 5. International Harvester Co. has placed additional equipment for its Chicago tractor plant, including some drills. It is expected to buy additional equipment for another works shortly. Miehle Printing Press & Mfg. Co. has bought equipment, including a grinder, a shaper and several milling machines. Santa Fe railroad is reported to have placed several tools.

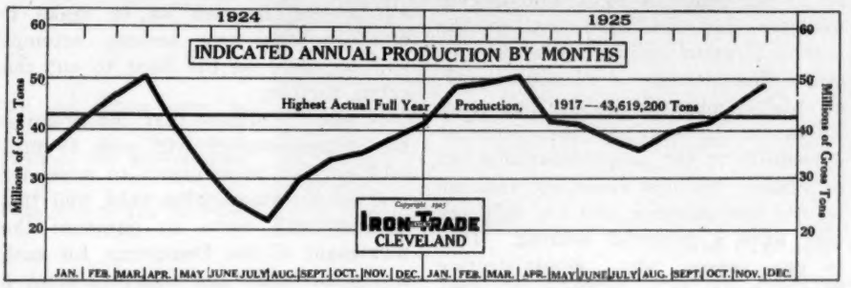
Cleveland, Dec. 8.—Although orders for machine tools and equipment were not as plentiful as during the corresponding period of November, they continue to be received in satisfactory volume. In spite of this fact, business probably is in better volume than in any December since the war. Prospective buyers are showing a tendency to delay purchases, giving as reasons for this action the approaching inventories, preparation of budgets and exhaustion of appropriations for this year. Automobile interests slowed down in buying last week. Eaton Axle & Spring Co., Cleveland, made a few additional purchases of small equipment.

Blast Furnace Awarded

Pittsburgh, Dec. 8.—After many delays due to reorganization, the Midland Coke & Iron Corp., St. Louis, at last signed a contract for its complete blast furnace plant Nov. 25, the general contract for the entire project going to the Riter-Conley Co. of Pittsburgh, as noted in IRON TRADE REVIEW of Nov. 26. This job involves a total tonnage of about 3700 tons of steel including some concrete bars for piling, foundations, etc., and as given calls for the complete plant—blast furnace, stoves, gas house, boiler house, power house, and all equipment including turbo-generators, turbo-blowers, boilers, hoisting engines, condensers, and a 15-ton power house crane.

Ingot Output Is Near Record


1924
1925
Highest Production, March 1924—161,796 Tons
Low Production, July 1924—72,223 Tons
Gross Tons
IRON TRADE
CLEVELAND
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.


1924
1925
INDICATED ANNUAL PRODUCTION BY MONTHS
Highest Actual Full Year Production, 1917—43,619,200 Tons
Millions of Gross Tons
IRON TRADE
CLEVELAND
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

STEEL ingot production in November made a gain in excess of that of October and established the fifth highest monthly rate of output in history as well as the highest November rate on record. It was the third highest month this year, being exceeded by both February and March. According to statistics compiled by the American Iron and Steel institute, from figures supplied by companies which in 1924 made 94.43 per cent of the country's total, production in November was 3,907,353 gross tons. The increase was 14,325 tons over the 3,893,028 tons of October. November had 25 working days as against 27 in October.

On an average daily basis, production in November represented 156,294 tons per day, which compared with the 144,186-ton rate of October, was a gain of 12,108 tons per day, or 8.4 per cent. The October gain was 7.3 per cent. The November rate was 96.7 per cent of the country's peak output of 161,796 tons in March 1924.

With 311 as the number of working days in the year and the production of 156,294 tons per day in November, the indicated annual rate of production was 48,600,000 tons. The indicated annual production rate of October was 44,840,000 tons. The country's actual production for a full year was in 1917 with 43,619,200 gross tons. The 11-month total for 1925 already stands at 40,211,058 tons, thus it appears certain that a new annual record is to be established this year.

Steel Ingot Production, 1924-25

94.43 Per Cent of Industry Reporting

Gross Tons

1924	Open hearth	Bessemer	All other	Monthly production companies reporting	Calculated monthly production all companies	No. of working days	Approximate daily production all companies gross tons	Change in daily production per cent
Jan.	2,766,534	667,032	12,577	3,446,143	3,649,913	27	135,182	+18.0
Feb.	2,902,641	695,905	14,085	3,612,631	3,826,246	25	153,050	+13.2
Mar.	3,249,783	706,801	15,260	3,971,844	4,206,699	26	161,796	+ 5.7
Apr.	2,575,788	573,381	12,356	3,161,525	3,348,466	26	128,787	—20.4
May	2,060,896	425,099	6,648	2,492,643	2,640,034	27	97,779	—24.1
June	1,637,660	310,070	2,622	1,950,352	2,065,676	25	82,627	—15.5
July	1,525,912	241,880	5,162	1,772,954	1,877,789	26	72,223	—12.6
Aug.	2,042,820	361,781	5,764	2,410,365	2,552,891	26	98,188	+36.0
Sept.	2,252,976	409,922	6,864	2,669,762	2,827,625	25	108,755	+10.7
Oct.	2,505,403	438,468	7,058	2,950,929	3,125,418	27	115,756	+ 6.4
Nov.	2,479,147	459,349	8,403	2,946,899	3,121,149	25	124,846	+ 7.8
Total 11 mos.	25,999,560	5,289,688	96,799	31,386,047	33,241,906	286	116,230	.....
Dec.	2,811,771	546,506	11,707	3,369,984	3,569,251	26	137,279	+ 9.9
Total	28,811,331	5,836,194	108,506	34,756,031	36,811,157	312	117,984	.....
1925								
Jan.	3,262,743	689,996	11,960	3,964,704	4,198,564	27	155,502	+13.3
Feb.	2,931,964	602,042	13,014	3,547,020	3,756,243	24	156,510	+ 0.6
Mar.	3,336,169	614,860	13,633	3,964,662	4,198,520	26	161,482	+ 3.1
Apr.	2,857,802	515,715	14,182	3,387,699	3,587,524	26	137,982	—14.5
May	2,754,130	497,708	13,790	3,265,628	3,458,253	26	133,010	— 3.6
June	2,538,988	476,945	12,490	3,028,423	3,207,056	26	123,348	— 7.2
July	2,444,969	457,095	13,547	2,915,611	3,087,590	26	118,753	— 3.7
Aug.	2,696,667	523,734	12,914	3,233,315	3,424,034	26	131,694	+10.9
Sept.	2,737,251	547,121	13,977	3,298,349	3,492,904	26	134,342	+ 2.0
Oct.	3,075,995	584,567	15,624*	3,676,186*	3,893,028*	27	144,186*	+ 7.3
Nov.	3,091,281	581,347	17,085	3,689,713	3,907,353	25	156,294	+ 8.4
Total 11 mos.	31,727,964	6,091,130	152,210	37,971,304	40,211,058	285	141,091	.....

*Revised.

Denies Borrowing Plan

Vigorous denial that the Bethlehem Steel Corp. needs funds or is attempting to raise money was made by Chairman C. M. Schwab of the company in a recent interview at Baltimore. Mr. Schwab was accompanying a group of company officials and representatives of a number of leading banks of the country on a tour of inspection of Bethlehem properties. This trip, now completed, gave rise to the report that Bethlehem was seeking to arrange a bond flotation. Within a few years, declared Mr. Schwab the company's plant at Sparrows Point will be the greatest steel plant in the world. Its present force of 9000 employes will be increased to 27,000.

Demonstrates Tools

Cincinnati, Dec. 8.—On Dec. 1 the Niles Tool Works Co. entertained more than 75 representatives of railroads and manufacturing concerns at a demonstration of the line of machine tools designed and built at the Hamilton, O., works of the company. Among the machines which were displayed and which attracted considerable interest were a new design of 48-inch car wheel borer, a 42-inch time saver planer and a new 90-inch locomotive axle journal turning lathe. At noon the visitors were luncheon guests, the luncheon being served in the administration building. On the two succeeding days, Dec. 2 and 3, the company conducted a sales conference of its district representatives.

Take Early Action on Taxes

House Members Likely to Pass Measure Substantially as Agreed on in Committee —Fight Made Against Reduction of Surtax From 40 to 20 Per Cent—Publicity Feature May Be Repealed

By F. B. Pletcher

WASHINGTON, Dec. 8.—General debate on the new tax reduction measure, to be known as the revenue law of 1926, actually is under way, with the opening of congress yesterday, and the outlook becomes more favorable for the passage of the bill by the house of representatives, substantially in the form approved in the harmonious session of the ways and means committee.

The general debate on the bill will occupy about a week, after which the reading of the bill, section by section, for amendments will occupy another week. It seems probable that the house may succeed in passing the measure before it adjourns for the Christmas holidays.

Certain groups of industries, of course, are disappointed because the committee failed to repeal the tax of $1 per $1000 on corporation stock surplus and stock earnings above $5000. The corporation earnings tax of 12½ per cent also is retained. The repeal of the capital stock tax would mean a loss in tax receipts to the government of about $95,000,000 yearly, and the corporation earnings tax also is a large revenue producer. An amendment to bring about the repeal of the capital stock tax undoubtedly will be submitted on the floor of the house but little prospect of its success is seen. The principal effort along the line of the repeal of the latter will have to be for the substitution of an increase in the tax on corporation earnings for the capital stock tax.

Assaults that will be made on the bill by the restless Republicans of some of the middle western and far western states, and the Democrats, in the senate will center on the form of amendments for the retention of high surtaxes and high estate taxes, for a graduated corporation earnings tax to scale upward and to increase the present 12½ per cent tax, the retention of publicity of amounts paid by taxpayers, proposals for further boosting of personal exemptions, and for the repeal of additional miscellaneous taxes.

Outside of the extreme radical group, members of both parties are counted upon to approve the reduction of the maximum surtax from 40 to 20 per cent. A fight will develop to have this maximum tax on the higher incomes moved up to 25 per cent. The attitude of Senator Borah, of Idaho, must be taken into consideration in viewing the probable opposition to the administration's tax program. He has remained taciturn on the tax measure and his influence may have a powerful bearing. That is one reason why administration forces have been bidding for the favor of the Idaho senator.

The author is editorial representative at Washington of IRON TRADE REVIEW.

The sentiment for the retention of high estate taxes may be somewhat greater than in the case of surtaxes, but in that case also many reasons are seen to believe that the reduction in the maximum from 40 to 20 per cent will be approved.

The fight for the repeal of the publicity provision of the tax law, as advocated by President Coolidge and Secretary of the Treasury Mellon, appears to have been won, at least so far as the house is concerned. Even in the senate, where the conservatives do not have the same measure of control as in the house, an even chance appears for the approval of the publicity repeal, as provided in the pending bill. A fairly heavy vote, however, may be cast for the retention of publicity in the house, as well as in the senate.

The issue on increased exemptions, which originally was put forward as one of the principal proposals of the Democrats, largely has collapsed as a result of the increase granted by the ways and means committee. Some political elements would like to make it unnecessary for anyone with an income of less than approximately $5000 to pay income taxes. This movement is not likely to get far in view of the fact that the committee has approved exemptions that are believed by Secretary Mellon to be excessive. The administration leaders would like to put exemptions back to $1000 and $2500, as provided in the present law, but the present disposition is not to press the matter on the floor of the house for fear of upsetting the compromise nonpartisan arrangement.

The reduction of normal taxes as outlined in the bill and conceded by all groups, is such as to make it unlikely that any serious attempt will be made on the floor to cut the rates further.

It seems unlikely that the automobile manufacturers will seek to proceed further in attempts to wipe out the tax on automobiles sold, and this attitude will serve to puncture the movement of the Democrats for such a repeal. This tax was cut from 5 to 3 per cent. The ways and means committee also headed off another move by the Democrats by eliminating completely the stamp tax on deeds and conveyances.

It is difficult to foresee what the senate finance committee will do with the measure after it passes the house. Some profess to see little possibility that the measure will be changed to any extent before it reaches the senate floor in January. Probably the 1926 tax bill will show less vulnerable points of attack than has been the case in previous tax law revisions since the war. Numerous amendments will be submitted in the house, many of which will receive substantial support, but those which may be adopted are not expected to alter essential features of the bill materially.

A number of the Republican leaders expect the greatest difficulty in blocking amendments which would increase the amount of tax reduction, which now stands at $325,000,000 annual revenue for the calendar year 1926. It would not be surprising to these administration leaders if a few additional cuts were authorized, but they express confidence that the total can be kept below $350,000,000.

To permit of more flexibility in rolling plates and skelp the 82-inch sheared plate mill of the Republic Iron & Steel Co., Youngstown, O., will be changed to a universal mill.

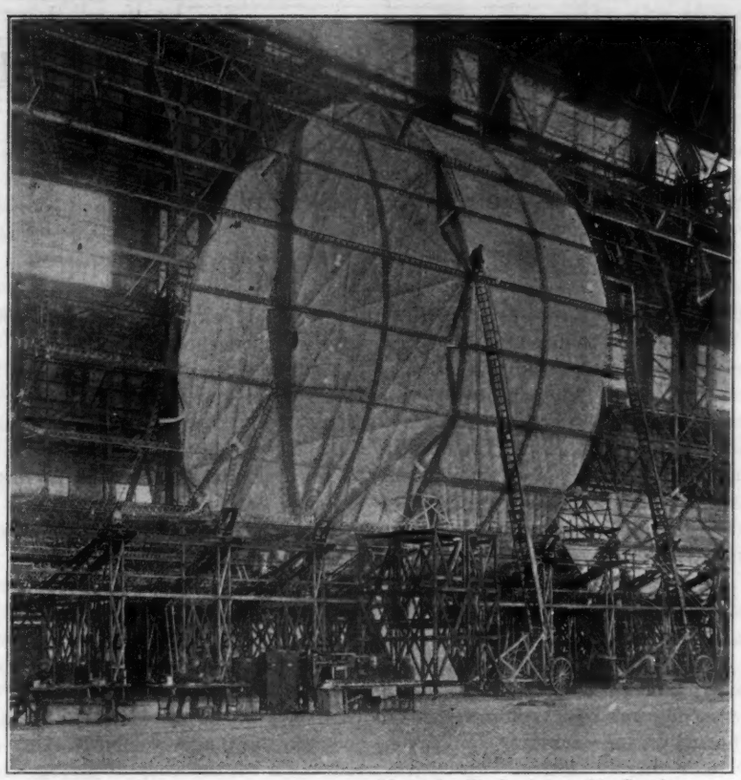


Photo by U. S. Army Air Service

The air service came in for discussion on numerous occasions at the annual meeting. The accompanying illustration was used by H. H. Blee in his paper on "The Airship and Its Place in Commerce"

Judge E. H. Gary, at the National Defense session, warned against political juggling in the case of the report of the aircraft board. Plans for national defense were declared important

A. S. M. E. Program Diversified

Sessions Arranged by Professional Divisions Bring Forth Discussion on Many Subjects—Honorary Memberships Conferred on Hoover and Warner—National Defense Plans Are Considered

APPROXIMATELY 2000 members of the American Society of Mechanical Engineers who attended the forty-sixth annual meeting last week in New York, will remember the program as one of the best presented in the history of the society. The quality of papers presented and character of the discussion was noticeably high in the sessions conducted by the machine shop, power, fuels and materials handling divisions.

In accordance with a policy adapted several years ago two lectures on non-technical subjects were delivered. Secretary of Commerce Herbert Hoover presented the Henry Robinson Towne lecture on engineering and economics, and Dr. Zay Jeffries, Cleveland, metallurgist, gave the Robert Henry Thurston lecture covering the subject of engineering and science.

Following the president's address Wednesday evening, honorary memberships in the society were presented to Secretary Hoover and to Worcester Reed Warner, Warner & Swasey Co., Cleveland.

During the week inspection trips were made to the Hell Gate station of United Electric Light & Power Co., the Edison Lighting institute at Harrison, N. J., and the Bethlehem plant of the Bethlehem Steel Co.

The annual dinner was served Wednesday evening, with Dr. Michael I. Pupin the principal speaker. Elbert H. Gary, Secretary of War Dwight F. Davis, Assistant Secretary Hanford MacNider, and Gen. James G. Harbord spoke at a national defense meeting held Thursday evening.

Lecturers Point Way To Wider Use of Sciences

IN CHARACTERISTIC fashion, Secretary of Commerce Herbert Hoover, delivering the Henry Robinson Towne lecture on "The Economic Value of Research in Pure Science," summed up the present situation by stating that the money annually devoted to this type of investigation is "less than one-tenth what we spend on cosmetics." The lecture is given in abstract elsewhere in this issue.

This lecture preceded the awarding of honorary memberships in the American Society of Mechanical Engineers to both Secretary Hoover and to Worcester Reed Warner, Warner & Swasey Co., Cleveland, and president of the society in 1897. Retiring president William F. Durand also announced the officers for the coming year and presented the newly elected executive, William L. Abbott, Commonwealth Edison Co., Chicago.

The first of the lectureships established under the Robert Henry Thurston fund was delivered by Dr. Zay Jeffries Aluminum Co. of America, Cleveland, on the subject of "Engineering and Science in the Metal In-

Pure Science Needs Greater Support

Industrial Research and Progress Depend on Original Scientific Investigation—More Funds Required for This Branch

By Herbert Hoover

THERE is no body of men more interested in the advancement of pure science than our engineers, for the engineering profession is built upon the application of scientific discovery. And of larger vision, if we would command the advance of our material, and to a considerable degree, of our spiritual life, we must maintain the earnest and organized search for truth. We could well put such an appeal wholly upon moral and spiritual grounds; the unfolding of beauty, the aspiration to knowledge, the ever widening penetration into the unknown, the discovery of truth, and finally, as Huxley says, "the inculcation of veracity of thought." All are ample justification for our finding dollars to keep these searchers alive. But as I am proposing to support an appeal for dollars, I propose to discuss the dollars' results as well.

Research in the biological and physical sciences takes two forms; industrial research, which is the application of science, and research in pure science. Obviously there must first be a pure science before there can be an application. I am aware that there is a twilight zone between them, but no scientist has difficulty in finding the borders.

While we have in recent years developed our industrial research upon a scale hitherto unparalleled in history, we have by no means kept pace in the development of research in pure science. We have an increase in some ten years from 100 to over 500 laboratories engaged upon search for applications of known scientific fact and law. These results have been magnificent. But all these applied science laboratories are dependent upon the raw material which flows from the laboratories and men engaged in pure science. And the industrial investigators are the first to demand more support to pure science.

Compared with other expenditures of far less importance to human welfare, the amount of money annually devoted in the United States to the aid of investigators and investigation in pure science is absurdly small. It is less than one-tenth what we spend on cosmetics. We have indeed some fine foundations for pure scientific research. The Carnegie institute, the Smithsonian institution, the Rockefeller institute, and the many other research activities of much more limited but special endowments the work of our universities, together with the work of the National Research council and our government agencies have shown fine accomplishment in this field. But the whole of the income available from these sources for research in pure science certainly does not exceed $10,000,000 a year, whereas in the professional schools of our universities, in technical and agricultural colleges, and experiment stations, in industrial laboratories and in our government bureaus we probably expend today $200,000,000 a year upon applied science research.

The wealth of the country has multiplied far faster than the funds we have given for these pure science purposes. And the funds administered in the nation today for it are but a triviality compared to the vast resources that a single discovery places in our hands. Men of science know, from their own experiences how seriously scientific work has been impeded by lack of resources, and they will appreciate how great, in the aggregate, must be the resulting loss to the nation and to the world.

The progress of civilization, as all clear-thinking historians recognize, depends in large degree upon "the increase and diffusion of knowledge among men." It is not merely a question of applying present-day science to the development of our industries, the reduction of the cost of living, the eradicatio of disease, and the multiplication of our harvests or even the diffusion of knowledge. We must add to knowledge, both for the intellectual and spiritual satisfaction that comes from widening the range of human understanding, and for the direct practical utilization of these fundamental discoveries. A special study in an industrial laboratory, resulting in the improvement of some machine or process, is of great value to the world. But the discovery of a law of nature, applicable in thousands of instances and forming a permanent and ever available addition to knowledge, is a far greater advance.

If we were to survey the nation we should find that the technically trained men engaged in pure science research fall into two main groups, on one hand, those supported in the great pure science research institutions, and on the other, those in our universities, or engaged in individual investigation. The number supported by our pure science research institutions, such as the Carnegie, Rockefeller, Smithsonian, and others probably does not exceed 500 technically trained men. Those engaged in pure science research in our universities or upon their own resources probably do not exceed 5000, and most of these devote only part of their time to this work. And there are some men in our industrial laboratories who are engaged in pure science work. It is an interesting contrast that the scientifically trained personnel in our applied science investigation today probably exceeds 30,000. The problem as I see it is to secure much larger support:

First, to our university men, in order that they may be able to give a larger proportion of their time to research, and that our universities may increase the number of men.

Second, to co-ordinated research for certain definite purposes.

Third, to the pure science research institutions.

Abstract of address by secretary of commerce before American Society of Mechanical Engineers, New York, Dec. 1.

dustry." Dr. Jeffries traced the development of the metal industries, pointing out that annually today iron accounts for 93 per cent of all metals produced.

He stated that two main developments are taking place in the metal industry at the present time. First, means are being devised to make a pound of metal give more service. Second, as industry becomes more complicated, a greater demand arises for metals and alloys of special properties. It is estimated that the alloy steel industry in the last 15 years has grown eighteen times more than the rest of the steel industry and today over 500 metals and alloys of different composition are in use.

"Constant changes in the metal art and constant revisions of processes and methods make more difficult the task of the engineer. Up to about 50 years ago it could be said that the metal industry was all art and no science."

Linking the field of metallurgy with the realm of the mechanical engineer, Dr. Jeffries presented material to show that many problems involving the performance of metals under stress have been solved by the help of metallurgical analysis of internal structures.

At the general business session Wednesday, Secretary Calvin W. Rice announced that the society has become a member of the International Electrotechnical commission in which capacity the preparation of international codes will be undertaken.

New Officers

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

President

WILLIAM L. ABBOTT
Commonwealth Edison Co., Chicago

Vice Presidents

WILLIAM T. MAGRUDER
Ohio State university, Columbus, O.

ROY V. WRIGHT
Simmons-Boardman Publishing Co., New York

A. G. CHRISTIE
Johns Hopkins university, Baltimore

Treasurer

ERIK OBERG
Industrial Press, New York

Secretary

*CALVIN W. RICE, New York

*Re-elected.

One of the most interesting and valuable sessions, non-technical in nature as it proved, was enriched by the notes of William E. Wickenden, director of investigation, Society for the Promotion of Engineering Education, New York. Mr. Wickenden described the engineering educational systems of Europe as compared with those here, pointing out the inadequacy of a system which tends to ignore or to deny graded systems of technical responsibility. He stated that greater flexibility and adaptation to industrial needs exists abroad. In view of anticipated early publications, Mr. Wickenden's remarks on European methods of education were held confidential.

A second paper was presented at this session, by D. L. Hoopingarner, director, New York Building congress, New York, on the "Apprenticeship Movement and Its Relation to the Building Trades." It was pointed out that school training has lamentably ignored practical training, and that co-ordination of apprenticeship training with industry is necessary to prevent interruptions of construction work.

Discuss Problems of Machine Shop Practice

PROBLEMS of machine shop practice were discussed at two sessions. Two papers were presented Tuesday morning, the first by C. A. Norman, Ohio State university, Columbus, O., on "Tension Ratios and Transmissive Power of Belts," depicting and charting results of tests made following a study of continental conditions. Employing slips from 1.62 to 12.5 feet per minute, for several types of belts, the author found that with cast iron pulleys the transmissive power of belts shows a general tendency to increase with slip. In the discussion R. F. Jones, Cornell university, Ithaca, N. Y., questioned the value of friction pulley tests in belt performance.

The second paper, "Principles and Advantages of Optical Methods for Measuring Machine Parts," by H. F. Kurtz, Bausch & Lomb Optical Co., Rochester, N. Y., illustrated the use of different types of optical instruments. These included interference apparatus, optical levers, imaging systems and optical scale reading for measurements under actual shop conditions. G. M. Eaton, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., cautioned against overemphasizing static as opposed to dynamic tests, and suggested that optical methods be devised to assist manufacturers in lining up bearings.

Builders and professors of machine design crossed swords on "The Question Mark in Machine Design," by F. E. Cardullo, G. A. Gray Co., Cincinnati, read in absence of the author by A. L. Jenkins, University of Cincinnati, at the second machine shop practice session. The chief bone of contention was the statement that "Professors of mathematics have grown gray-headed and round-shouldered trying to figure out how a stress which can exist only along a straight line, can also be bent around a half-circle. The answer is that it doesn't and that the G-frame is a mechanical monstrosity."

Mr. Jenkins, citing the example of the inapplication of Hooke's law for stresses of certain metals, declared that trade demands, mathematical calculations notwithstanding, can be expressed better by the dollar mark than by mathematical formulas. J. H. Billings, Drexel Institute, Philadelphia cautioned against throwing overboard laws which do not serve in all cases, their inapplication simply indicating the existence of further laws yet unknown.

"Some Comparative Wear Experiments on Cast Iron Gear Teeth," by Guido H. Marx, L. E. Cutter and B. M. Green, all of Stanford university, Calif., was outlined in absence of the authors by Professor W. R. Eckart of the same institution. Tests conducted on cast iron gears showed that in resistance to wear the standard depth form 20-degree involute tooth gear appears the best.

A third paper was presented by G. M. Eaton, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., on "Normal Pitch—the Index of Gear Performance." Mr. Eaton reported that quiet gear performance can be assured only by keeping within proper limits variables in the gear proper and in gear mounting. Discussion reminded that gear noise in itself is not an undesirable quality, an instance being cited of an apparently mechanically perfect gear, noisy when running idle, which became quiet under a 60-pound load.

Three papers were presented at the Thursday session on power plant materials. In the first, "Heat Treatment Data on Quality Steel Castings," A. E. White, University of Michigan, Ann Arbor, Mich., stated that for most steel casting purposes a straight carbon steel is adequate, presenting general analysis

limits therefor, as follows: carbon 0.15-0.50 per cent; manganese 0.50-1.00; silicon, always above 0.20; sulphur, not above 0.05, and phosphorus, not above 0.05 per cent.

William P. Wood, dealing with "Bolts for Use in Power Plant Construction," cited examples of indiscriminate usage of steel and wrought iron. Other instances were noted where bolt shanks were steel and the nuts wrought iron. Mr. Wood recommended a standard procedure in constructing steam power plant equipment, and presented tentative specifications for high temperature alloy bolting.

In the discussion, it was declared that the current problem of bolt manufacturers is to obtain steel wtih uniform chemical and physical properties. In regard to the value of ductility, it was pointed out that this quality is important only when the yield point has been exceeded, a fact not usually considered in selecting steel parts.

The final paper, contributed by E. B. Powell, Stone & Webster, Inc., Boston, proved a valuable addition on the subject of "Boiler Furnace Refractories." The author with photographic slides, told of his experiences with spalling and eroding of furnace wall refractories. A method was then described for conducting four simultaneous investigations of refractory clays and cements, subjected to identical conditions, in a special apparatus for testing the effects of molten slag.

Engineers Show Interest in Industrial Furnaces

INDUSTRIAL power and industrial heating furnaces proved interesting topics to members of the society, judging from the attendance at sessions on these subjects Tuesday. Two papers on industrial power were read and three on industrial furnaces.

Experimental data of central stations on the utilization of steam pressures up to 1200 pounds per square inch, obviates the necessity of extensive work in this field by the industrial power plant, declared William F. Ryan, Solvay Process Co., Syracuse, N. Y., in a paper on "The Value of Higher Steam Pressures in the Industrial Plant." Discussion brought out the fact that kilowatt cost must include interest, taxes and similar factors in the production of power. Mr. Dickinson, General Electric Co., Lynn, Mass., declared that in the end the question of steam pressures must be settled on the score of economy. Mr. Ryan objected to the inference made that supervision of the industrial power plant does not compare favorably with the central station.

The paper of William H. Larkin, United States Rubber Co., Passaic, N. J., on "The Supply of Industrial Power," gave valuable operating data for non-technical power users and factory managers. In discussing this subject E. M. Funk pointed out that interest charges on all investments and equipment should be included in power costs, and that too often an arbitrary 6 per cent is charged.

At the session on industrial furnaces the tendency seemed more to indicate treatment of heating as an art rather than industrial furnaces themselves as a subject. It was regretted that the two chief reasons for the backwardness of heating today lie in technical over-enthusiasm and unwarranted sales propaganda.

Methods which might be more efficient are often employed in producing small articles because for such products heating is often but one per cent of the final cost. This was brought out by W. Trinks, Carnegie Institute of Technology, Pittsburgh, in his paper on "Industrial Furnaces." Expediency and relative costs also explain why gas, powdered coal and coal on the grate are used in large industrial furnaces but drop out almost entirely for fine work in small furnaces. The author stated that attempts to improve conditions in the sheet steel industry by the application of surface combustion burners using coke oven or natural gas have been retarded chiefly by "conservatism." He pointed out that those who have made such changes have secured absolute control of furnace temperatures and atmospheres.

"Industrial Furnace Efficiency" was the subject of a paper by Victor J. Azbe, consulting engineer, St. Louis. The author listed the following heat losses encountered: Losses due to dry combustion products, excess air, radiation, incomplete combustion, unburned combustibles, moisture from hydrogen combustion, moisture in the air, and moisture in atomizing fuel and steam at oil burners when used. Mr. Trinks, discussing waste heat boilers, stated that the refractory question should come first, for unless proper efficiency is obtained there, efficiency of boilers and condensers cannt proceed. W. R. Clark, Bridgeport Brass Co., Bridgeport, Conn., cited as an illustration of wider use of the "dollar efficiency curve" in the brass industry, the abandoning of coal for electric melting. Apart from the fuel question, the cost of furnace linings and crucibles and the decreased cost of refractories has wrought this change, he declared.

Stress Importance of National Defense Plans

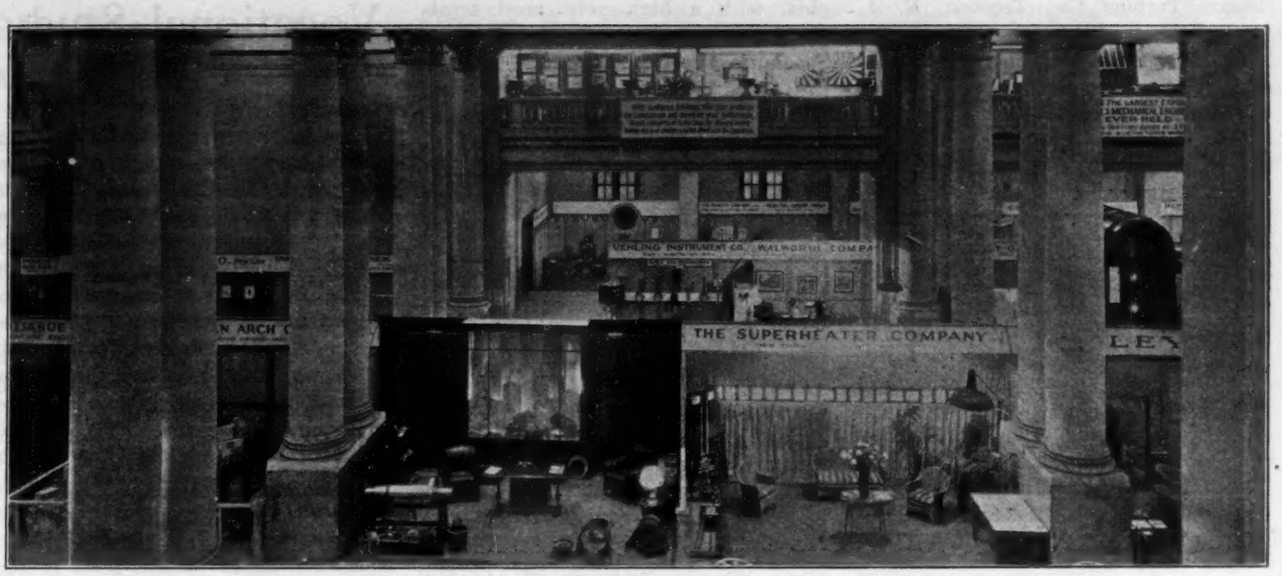
INDUSTRIAL preparedness as the best assurance of national defense was the keynote of a meeting on industrial co-operation with the war department, held Thursday evening, Dec. 4. Judge Elbert H. Gary, as chairman, expressed apprehension that the present somewhat distorted public view of the aircraft situation might react against the report of the Dwight F. Morrow aircraft board in the next session of congress. Speaking of this report, which already has been presented to President Coolidge, Judge Gary said:

"The statesmanlike report of the Morrow board should put an end to controversy. All concerned have had their day in court and in a spirit of fairness should abide by the referee's ruling. But we hear that this may not be the case. We view with apprehension the possibility that national defense may become the football of politics in the forthcoming session of congress. There appears to be a desire on the part of a certain element in congress to investigate the investigators and so prolong the controversy, ad infinitum, whereas what the army and navy really need most at this time is a moratorium of agitation from within and investigation from without."

Representing the war department were Secretary Dwight F. Davis and Assistant Secretary Hanford MacNider. The program also included General J. G. Harbord, president of the Radio Corp. of America, and Maj. Gen. Charles P. Summerall, commander of the Second Corps area. Gen. Harbord, like Judge Gary, expressed regret over the inability of the public to judge soundly of the air controversy.

Realization of the economies derived from efficient handling of materials in industrial plants was evident at the session Wednesday morning, when

(*Concluded on Page* 1508)



A view in Grand Central Palace showing exhibits at Fourth Annual Power Show

Power Show Largest Ever Held

Fourth Exposition of Power and Mechanical Engineering at Grand Central Palace Reveals Large Volume of Newly Developed Equipment—Nearly 400 Exhibitors Display Products—Attendance Large

IT CAN be said of the Fourth Annual Exposition of Power and Mechanical Engineering, held last week at the Grand Central Palace, New York, that the show was "as advertised"—the "Largest Exposition of Power and Engineering Ever Held." Displays of 395 manufacturers of allied equipment covered three full floors, and the attendance exceeded the 70,000 mark of 1924.

Perhaps the outstanding feature of the exposition was the large number of exhibits featuring equipment placed on the market during the past year. Practically every device required for efficient power generation, distribution and control, and for handling and installing equipment and materials therefor, could be seen at this exhibition. One of the most interesting booths was that of the Springfield Boiler Co., Springfield, Ill., where a completely equipped model of the Hell Gate electric power station of the United Electric Light & Power Co., New York, was on display. Exhibits of ball and roller bearings were numerous.

Display Machines and Transmission Devices

MORE than a score of builders of machine tools and equipment were represented at the exposition. The operating exhibit of the National Acme Co., Cleveland, consisted of an automatic screw machine with self-opening dies and collapsing taps. The Peerless Machine Co., Racine, Wis., simulated production work on its new dry cut power metal sawing machine. Another operating exhibit was that of Pratt & Whitney Co., New York, with a 16-inch metal lathe and a 6-inch vertical shaper. Nearby, the nibbling and punching machines of Andrew C. Campbell, Inc., Bridgeport, Conn., attracted by rapidly cutting external and internal outlines in metal.

A number of other metal cutting machines were in evidence, among them the newly marketed hand shearing device of the Unishear Co., Inc., New York. The Racine Tool Co., Racine, Wis., operated a high speed automatic cutter. Milling, grinding and nibbling machines were displayed by the Triplex Machine Tool Co., New York. A new type portable pipe threading machine was the feature of the Toledo Pipe Threading Machine Co., Toledo, O.

Various grinding machines were in operation in the hall, a notable demonstration being that of the Production Machine Co., Greenfield, Mass., with a centerless polishing and finishing machine and a production finishing machine designed for flat work. The booth of the Wisconsin Electric Co., Racine, Wis., contained a line of motor driven portable grinders, while the Ex-Cell-O Tool & Mfg. Co., Detroit, had its new type grinding spindle on display. Hanson-Whitney & Co., Hartford, Conn., displayed and operated its drill presses and milling machines.

B. C. Ames Co., Waltham, Mass., showed a bench lathe and milling and filing machines; the American Car & Foundry Co., New York, electric rivet heaters; and the Bilton Machine Tool Co., Bridgeport, Conn., and Detroit Twist Drill Co., Detroit, exhibited their products. Hardness testing and static dynamic balancing machines were displayed at the booth of the Tinius Olsen Testing Machine Co., Philadelphia.

Makers of gears and transmission units were well represented this year, among them being the De Laval

Steam Turbine Co., Trenton, N. J., with its helical gears and newly developed worm reduction units. Other transmission manufacturers displaying their products were: Falk Corp., Milwaukee, herringbone speed reduction units; Foote Bros. Gear & Machine Co., Chicago, vertical worm and spur gear reducers; Philadelphia Gear Works, Philadelphia, silent chain drives and industrial gears; Whitney Mfg. Co., Hartford, Conn., silent and roller chain drives; Reeves Pulley Co., Columbus, Ind., variable speed transmission; also Cleveland Worm & Gear Co., Cleveland, Niles-Bement-Pond Co., New York, Boston Gear Works Sales Co., Norfolk Downs, Mass., W. A. Jones Foundry & Machine Co., Chicago, and Allis-Chalmers Mfg. Co., Milwaukee.

The large number of exhibitors of ball and roller bearings indicates an ever-widening application of these products. Among those participating in this group were: Bearium Bearings., Inc., New York, Hyatt Roller Bearing Co., Newark, N. J.; Fafnir Bearing Co., New Britain, Conn.; Strom Ball Bearing Mfg. Co., Chicago; Norma-Hoffman Bearings Corp., Stamford, Conn.; Marlin-Rockwell Corp., Jamestown, N. Y.; and Nice Ball Bearing Co., Nicetown, Philadelphia.

Included in the large number of manufacturers of flexible couplings one of the newest varieties was that of Smith & Serrell, Newark, N. J. Bartlett-Hayward Co., Baltimore, exhibited a 50,000-pound type for operation at 1500 revolutions per minute. Other coupling exhibitors: Thomas Flexible Coupling Co., Warren, Pa., and Barco Mfg. Co., Chicago. Materials handling equipment: American Chain Co., Bridgeport, Conn., American Pulley Co., Philadelphia, Yale & Towne Mfg. Co., Stamford, Conn., and Brown Hoisting Machinery Co., Cleveland.

Welding equipment appeared in the booths of the Wilson Welder & Metals Co., Inc., Hoboken, N. J., with portable gasoline engine driven apparatus, and of the Torchweld Equipment Co., Chicago.

Refractories Exhibit Products

The emphasis being laid on refractories as a major element in power plant efficiency was reflected in the number and extent of materials displayed last week. This portion of the exposition was exceeded by no other in size or in elaborateness.

Several refractories makers, notably the American Resistor Co., Philadelphia, with a high-speed steel treating furnace, and the Quigley Furnace Specialties Corp., New York, heating fire brick cement to 2700 degrees Fahr., operated miniature furnaces. Among the other refractories exhibitors were: Plibrico Jointless Fire Brick Co., Chicago; M. H. Detrick Co., Inc., Chicago; King Refractories Co., Buffalo; American Arch Co., Inc., New York; Combustion Engineering Corp., New York; General Refractories Co., New York; A. P. Green Fire Brick Co., Mexico, Mo.; Carborundum Co., Perth Amboy, N. J.; Keytone Refractories Co., New York; McLeod & Henry Co., Troy, N. Y.; Norton Co., Worcester, Mass.; Queen's Run Refractories Co., Lock Haven, Pa.; Waite & Davey Co., Inc., Long Island City, N. Y.; Botfield Refractories Co., Philadelphia, and Bernitz Furnace Appliance Co., Boston.

Displays of insulating materials in the booths of the Celite Products Co., Chicago, Armstrong Cork & Insulating Co., Pittsburgh, Insulating Products Corp., New York, and Johns-Manville, Inc., New York, pointed to present efforts of boiler furnace engineers to prevent unnecessary heat losses.

Wide applications of powdered coal were evidenced by the multiplicity of devices required for preparing, storing, distributing and burning pulverized fuel. Such equipment was shown at the large exhibits of the Aero Pulverizer Co., New York, Erie City Iron Works, Erie, Pa., Raymond Bros. Impact & Pulverizer Co., Chicago, Harding Co., Inc., New York, Pennsylvania Crusher Co., Philadelphia, and Riley Stoker Corp., Worcester, Mass.

One of the largest displays and outstanding in the refractories field was that of the Combustion Engineering Corp., New York. A hollow wall air-cooled furnace, a water-cooled furnace, a self-supporting type wall, a pulverizing mill and a burner for horizontal firing in restricted areas, were on exhibit here.

From Iron to Power

The site of one of the oldest charcoal furnaces in Center county, Pennsylvania is about to be turned into the only hydroelectric plant in this section of the state. It is the old McCoy & Linn furnace, near Milesburg, which was erected over a century ago and operated until a few years ago. It is now owned by John McCoy, a great-grandson of one of the original owners.

Vocational Study

Is Discussed by National Society at Cleveland Convention

At it nineteenth annual convention held at Hotel Statler, Cleveland, Dec. 3-5, the National Society for Vocational Education went on record as favoring an amalgamation with the Vocational Education Association of the Middle West and a new constitution looking toward that end was adopted. Edwin A. Lee, University of California, was elected to head the new organization should the Middle West association at its convention in Des Moines next March also approve the consolidation.

The society took action urging the creation of a federal department of education under which the present board for vocational education will be operated without impairment of its present powers. This year for the first time the exhibit of equipment used in schools was made a part of the convention program. Some twenty-five manufacturers were represented with exhibits which included machine tools, hand tools, gages, etc.

Franklin T. Jones, supervisor of training, White Motor Co., Cleveland, presided at a joint meeting of the part-time, trade and industrial sections on Thursday morning, the topic of the meeting being "Training in Industry." Papers presented at this session were: "Industry's Part," by F. E. Searle, superintendent of Ford schools, Ford Motor Co., Detroit; "The Factory School's Part," by E. W. Kempton, educational director, American Steel & Wire Co., Cleveland; "Cooperation," by C. G. Gaum, professor of engineering, Pennsylvania State college, State College, Pa.

The same sections held a meeting on Saturday mornnig with R. L. Cooley, director, Milwaukee Vocational school, Milwaukee, as chairman. The papers arranged for this meeting were: "The Place and Limitations of the State in Apprenticeship Training," by Stewart Scrimshaw, professor of Marquette university and director of industrial relations of Kearney & Trecker Corp., Milwaukee. "Part-Time Education by One of the Employers," by W. L. Luther, manager, service and employment department, Cleveland Metal Products Co., Cleveland; and "The Greatest Need of the Continuation and Part-Time School," by K. G. Smith, state director of vocational education of Michigan.

Gripnut Co., Chicago, has decreased its capital from $1,500,000 to $1,000,000.

Sales Executives Discuss Problems at St. Louis

St. Louis, Dec. 8.—The conference of the sales executives' division of the American Management association in co-operation with the sales managers' bureau of the St. Louis chamber of commerce, was attended by about 275 representatives of leading corporations.

The proceedings were opened Thursday, Dec. 3, with a paper on "Organizing Salesmen's Time," by C. K. Woodbridge, president, Dictaphone Corp., vice president of the American Management association and president of the Associated Field Managers of the World. This was followed by a discussion by Charles A. Steffeny, general sales manager, National Cash Register Co.

R. R. Deupree, Proctor, Gamble Co., read a paper on "Organizing a Campaign for a New Project," which was discussed by Matt Denning, E. I. DuPont de Nemours Co.; J. A. Harlan, Frigidaire division, Delco Light Co., and Martin Wolf, Bussman Mfg. Co.

"Fixing the Salesmen's Task" was the subject of a paper read Friday morning by L. V. Britt, sales manager, Burroughs Adding Machine Co. Following this were discussions by Waldo Emerson, Tidewater Oil Sales Corp. H. G. Kenagy, Armour & Co., and William Sample, Ralston Purina Co., St. Louis.

W. C. Dunlap, vice president, American Multigraph Co., was scheduled to read a paper on "Branch Office Management," at the final session, but was unable to be present, and his place was taken by C. E. Allen, local district manager, Westinghouse Electric & Mfg. Co. F. M. Payne, White Sewing Machine Co., and A. T. Kearny, Swift & Co., discussed the subject.

Speakers at two luncheons and the dinner on Thursday evening were Rush Butler, Butler-Lamb-Foster, attorneys; C. K. Woodbridge, E. T. Meredith, Publisher, and Carl F. G. Meyer, president, Meyer Bros. Drug Co., and president of the St. Louis chamber of commerce.

Purchasing Agents Elect

B. C. Sawyer, purchasing agent of Bethlehem Fabricators, Inc., Bethlehem, Pa., has been elected president of the Purchasing Agents association of the Lehigh valley. Mr. Sawyer, who is a charter member of that organization, also is a member of the steel committee of the National Association of Purchasing Agents. Other officers elected are: Vice president, J. N. Noll, Tilghman Moyer Co., Allentown, Pa.; secretary, A. J. Dion, Allentown Portland Cement Co., Allentown, Pa.; treasurer, N. P. Benner, Textile Farms, Allentown.

Directors elected include T. G. Greene, Ingersoll-Rand Co., Phillipsburg, N. J.; J. J. Kisthart, Bethlehem Construction Co., Bethlehem; E. Volbrath, Victor Balata & Textile Belting Co., Easton. A. L. Reiley, Warren Foundry and Pipe Co., Phillipsburg and M. B. Lewis, Phoenix Utility Co., Allentown, were elected directors of the National association.

Join Metal Trades

Ten additional firms recently were admitted to membership in the National Metal Trades association. The list includes Harrison Radiator Corp., Lockport, N. Y., Willys-Overland Co., Toledo, O.; Electric Auto-Lite Co., Toledo, O.; Merritt Engineering & Sales Corp., Lockport, N. Y.; Moto-Meter Co., Long Island City, N. Y.; Consolidated Steel Strapping Co., Chicago; C. E. Deveau Machine Co., Boston; Ohio Knife Co., Cincinnati, O.; Lehman Machine Co., St. Louis, and Bock Machine Co., Cincinnati, O.

Corporation Objects in J. & L. Case

WASHINGTON, Dec. 8.—While making no specific objection to the reopening of the Jones & Laughlin case, involving freight rates on iron and steel from Pittsburgh to St. Louis, the Illinois Steel Co., as intervener, in an answer filed with the interstate commerce commission objects to the Chicago-St. Louis rate being used as a yardstick for rates from Pittsburgh and adjacent steel producing districts.

The Illinois company's answer is a result of the petition for reopening the case, filed by the Jones & Laughlin Steel Corp. a week ago. Following efforts by steel producers in the Pittsburgh district in seeking rates lower than the fifth class on steel shipped from Pittsburgh territory to western Indiana, Illinois and lower Mississippi crossings, including St. Louis, the commission in a decision last April set up a mileage scale to be used by the carriers as a basis for making rates, but no adjustment has been made yet by the carriers.

The Illinois Steel Co. interposes no objection to the establishment of a reasonable basis of rates on iron and steel articles from Pittsburgh and adjacent steel producing districts to the common market destinations involved, but objects to a possible increase of rates, if the case is reopened, from the Chicago mills to the lower Mississippi crossings.

"If the reopening of this case means that the commission is to reconsider an increase in the present rates on iron and steel articles from the mills of the Illinois Steel Co. to the said common markets involved, predicated upon a fictitious relationship to a class rate schedule that does not now bear, and never has borne any relationship to the Chicago rate situation, the intervener then must object seriously thereto, and to any further attempt thus to unwarrantedly advance our rates," says the answer.

Testimony in behalf of the Illinois company and others in western steel producing districts, in the course of the hearing in the case, shows the more favorable transportation conditions surrounding the movement of steel products from the western mills to their nearby markets.

Commodity rates in Illinois and Indiana have been shown to be "fair, just and reasonable and show good, sound business judgment," the answer further states. An examination of the 17½-cent rate from the Chicago mills to St. Louis on any basis will show that the rate stands a fair test to the service performed, it is contended. The answer also states that the Jones & Laughlin company witnesses had expressed satisfaction with present groupings of the Illinois and Indiana rates. "Therefore, in our opinion," says the answer, "complainant is estopped from asserting that our rates are not the proper rates to be applied in the circumstances.

"Why unnecessarily prolong a discussion regarding rates of which admittedly there is not and cannot be any possible complaint?" the answer asks. "For if the long-haul rates from the eastern mills are wrong, or in other words, unjust and unreasonable in and of themselves, it would be a comparatively easy matter for complainant to demonstrate that fact to the commission without the necessity of bringing into the issue rates from another territory, where the transportation conditions are totally different and where the rates are controlled by a separate set of carriers.

Industrial Men in the Day's News

William H. Woodin, New President of American Locomotive Co.

STARTING as an errand boy in his father's company his rise has taken him through many phases of business experience to the top.

ALTHOUGH successful in industry and directing the policies of several large corporations, he maintains his desire always was to enter the medical profession.

HE IS a linguist of unusual ability, a musician and authority on coin collection; his hobbies include also fishing and yachting.

IT IS a well known fact that most men, however eminent in their respective places, have a secret yearning to be something they are not. William H. Woodin, president of the American Car & Foundry Co., and also, since Dec. 3, president of the American Locomotive Co., never has admitted any feeling of dissatisfaction over the fact that he is in business. But he has admitted that it always was his real desire to study medicine and become a physician.

Here is shown the extent to which Mr. Woodin, instead of becoming a doctor, has become immersed in business. He is a director of the American Beet Sugar Co., president and director of the American Car & Foundry Export Co. and a director of the American Exchange Securities Co., the American Ship & Commerce Corp., the Canadian Car & Foundry Co., the Compania Cubana, Cuba Co., Cuba Railroad Co., General Motors Corp., Montreal Locomotive Works, Westinghouse Electric & Mfg. Co. and the Westinghouse Electric International Co.

On the day of his election as president of the American Locomotive Co., Mr. Woodin was waited on by a number of reporters of New York newspapers. A modest man, who almost never says anything about himself, Mr. Woodin answered the questions that were put to him. What he said was unusually interesting. He professed to being a foundryman and he spoke about the fact that the fourth generation of his family now is in the business.

"I'm a pretty fair foundryman," he said with a smile. "My grandfather, who founded the Jackson & Woodin Mfg. Co. at Berwick, Pa., in 1835, and my father, who succeeded him in that company, made it a rule that their sons must start in the shops and get experience from the bottom up before assuming executive positions. My father worked in the shops, I worked there and my son is now following the same plan. Four generations—curious, isn't it?

"I consider the experience then gained invaluable and am glad I had it, even if there were occasions when I looked out of the shop window on a beautiful June day and wished I was somewhere else."

Mr. Woodin admitted that there are some disadvantages in being the son of the boss. "If father's son does anything wrong," he said, "there is a cry 'Oh yes, but he isn't a bit like the old man', but if he does anything right, he 'learned it from his father.' He is damned on every side just because he is the employer's son."

His father was not generous in giving out advice, says Mr. Woodin. He believed that the only way to achieve wisdom was through experience. When William reached the age of 16, his father gave him $10,000 with the suggestion that he see what he could do with it. His father made only one request and that was that the son was not to go in debt. William, among other things, bought Iowa Central at the wrong time, with the result that his $10,000 soon was gone. It safely may be assumed that the lesson that William learned at that time taught him the value of money.

Despite the fact that he was the son of the boss, Mr. Woodin received all the hard knocks that go with the climb up the ladder. He first ran errands for his father and others and did all sorts of odd jobs. His rise was gradual. In 1891 he was made general superintendent of his father's plant. In 1895 he was made vice president and in 1899 president. He then went with the American

Car & Foundry Co., which was organized at that time as a result of the initiative of his father.

Mr. Woodin has numerous activities and often takes part in civic work in New York. During the war he was fuel administrator for New York state, and the manner in which he discharged the duties of this office won for him wide admiration. He has a sense of logic which affords him singular freedom from the liability of making mistakes. Also, Mr. Woodin has striking ability to get a great deal of work done without any apparent effort. He seems to have time for anything that might arise. undoubtedly this impression is enhanced by the fact that he is a good listener and an effective talker who covers any subject in a few words. Certainly, there is no executive in New York who is less free from temperament and excitability than Mr. Woodin. His general characteristics are well mirrored in his physical appearance. He is well-set-up but at the same time slender. His physical movements, like those of his mind, are well directed and have an objective. His face and head are those of the scholar.

Mr. Woodin's yearning for the life of a physician suggests that he is aware of a principle to which every doctor subscribes. That is, a man must have an avocation as well as a vocation. Mr. Woodin is an accomplished musician. He plays a number of instruments well, particularly the piano. He is a prominent coin collector and, in collaboration with Edgar H. Adams, wrote a book on American coins which is regarded as authoritative. He is a linguist of unusual ability. In fact he is of the type that gladdens the heart of Thomas A. Edison; Mr. Woodin has great capacity to become "interested." On top of all these varied interests, he also is a good fisherman and an able yachtsman. Although 57 years of age, he looks younger and gives the impression that he feels a great deal younger.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

HENRY J. BARNES has been elected vice president of the Alumino-Thermic Corp., Roselle Park, N. J., manufacturer of welding materials and equipment. He has been connected with the company for three years, previously being in the sales department of the Metal & Thermit Corp., being district manager in charge of Canada.

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W. J. Henry is district manager of the new branch office at Charlotte, N. C., of the Harnischfeger Corp., Milwaukee, manufacturer of cranes.

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Nils Anderson, president of Debevoise-Anderson Co., Inc., New York, pig iron, coke and ore dealer, sailed for Europe last week.

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M. L. Murray has resigned as secretary, treasurer and general manager of the Alloy Metal Wire Co., Moore, Pa.

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H. A. Brassert, of H. A. Brassert & Co., Chicago, recently was elected a director of Blaw-Knox Co., Pittsburgh.

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W. H. Blauvelt, New York, has been appointed consulting expert of the gas commission of Philadelphia.

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Clarence E. Hohnhorst, superintendent of the Cincinnati Planer Co., Cincinnati, has resigned to take a similar position with the William Powell Co., that city. Oscar C. Willey, foreman of the Cincinnati company's tool room, has succeeded Mr. Hohnhorst.

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F. O. Hoagland, engineer at the Biddeford, Me., plant of Saco-Lowell Shops, has resigned to accept a position with Pratt & Whitney Co., Hartford, Conn.

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Howard A. Bateson has been appointed branch manager at Milwaukee for the Price Iron & Steel Co., Chicago. He formerly was with Jones & Laughlin Steel Corp. and Rogers Brown & Co.

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Ray A. Sossong, manager of gas plants, Air Reduction Sales Co., New York, was elected president of the International Acetylene association at its recent annual convention in Chicago.

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C. E. Phillips has been appointed representative in charge of the office at Wilkes-Barre, Pa., of the Allis-Chalmers Mfg. Co., Milwaukee. Mr. Phillips who formerly was connected with the Philadelphia office of the company, succeeds Guy V. Woody.

* * *

Walter L. Wensley has been elected to succeed the late George M. Basford as president of the G. M. Basford Co., New York, advertising agency.. Mr. Wensley has been associated with the company for eight years, the last three of which he was vice president.

Walter F. Mulhall, for the past four years account executive with the G. M. Basford Co., has been elected vice president. Before joining the agency, he was assistant to the general superintendent of the old Midvale Steel & Ordnance Co., then assistant to the vice president of the Tacony Steel Co. and Penn-Seaboard Steel Co.

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Charles L. Miner has joined the V. E. Montgomery Co., Cincinnati, pig iron, coke and alloy seller. He formerly was connected with Pickands, Brown & Co., Chicago, Matthew Addy Co., Cincinnati and W. C. Runyon & Co., Pittsburgh.

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Edgar F. Vant has joined the organization of B. Nicoll & Co., New York, importer of cast iron pipe as American representative of the Pont-au-Mousson works of France. He formerly was with the sales department of Carnegie Steel Co.

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I. Lamont Hughes, vice president of the Carnegie Steel Co. was given a farewell dinner by his fellow employes at Youngstown, O., Dec. 5. His offices were transferred from there to Pittsburgh, effective Dec. 1. Mr. Hughes was presented with a number of pieces of silver plate, A. C. Cook, safety manager, making the presentation address.

* * *

Cassius C. Chaney, just made vice president of the General Refractories Co., Philadelphia, had been general manager of that company. He started his connection with the refractories industry in 1906 with the American Refractories Co., later becoming su-

perintendent of its silica works at Rockdale, Ill. He was district manager for the Danville Refractories Co., Danville, Ill., in 1915 and in the following year joined the General Refractories Co.

* * *

Noble Dean, head of the Dean Hill Pump Co., Anderson, Ind., has moved his residence from Indianapolis to Anderson.

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E. A. Cowles has been made president and general manager of the Cowles Tool Co., Cleveland, to succeed the late H. S. Hunter.

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J. W. McDowell is head of the Avery Power & Machinery Co., Peoria, Ill., newly organized. George J. Jobst is vice president and H. J. Boynton, vice president and general manager.

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G. F. Preston has affiliated with Louis Henes, representative in the San Francisco territory of the Milwaukee Electric Crane Co., Milwaukee, manufacturer of machine tools.

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Clarence Honhorst, superintendent of the Cincinnati Planer Co., Cincinnati, has resigned to accept a like position with William Powell Co., that city. Oscar Willey succeeds him at the former company.

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G. E. Gleadell has resigned as assistant to the president of R. J. Crozier Co., Philadelphia, iron and steel dealer. He joined the company in 1916. He will be connected with Hine Desk & Fixture Co., Denver.

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W. P. Cox now is assistant general sales manager of the McWane Cast Iron Pipe Co., Birmingham, Ala.

Porter W. Alley is in charge of the Philadelphia office, and M. M. Grant, Jr., southern manager.

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Samuel L. Nicholson, assistant to the vice president of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been awarded the James H. McGraw medal in recognition of his work in promoting a standard electrical ordinance to establish uniformity in municipal inspection requirements. The medal is to be accompanied by $400 in gold, and a $400 annuity. Mr. Nicholson was the first representative of an electric manufacturer to receive the award.

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A. Beiersdorf, executive manager of the Charlottenburger Werk of the Siemens-Schuckertwerke at Berlin-Charlottenburg has returned to Germany following a visit of six weeks in this country. He was accompanied by Dr. Estorff, research engineer, and A. Kohn, production manager at the Charlottenburger Werk. The visit was mainly in connection with machine tools, of which the Siemens-Schuckertwerke is purchasing large quantities in this country.

* * *

W. J. Nugent, vice president and general manager of the Nugent Steel Castings Co., Chicago, has been elected president to succeed Charles Piez, at a meeting of the board recently.

Prentiss Coonley was elected vice president and C. A. MacDonald, secretary, was elected to fill a vacancy on the board. Mr. Nugent has been with the company since 1918, serving

EDWIN G. JONES

from that date until 1921 as vice president, being general manager as well since the latter year.

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Albert P. Slater, formerly with the Aluminum Castings Co., and later in charge of production of the McAdamite Aluminum Co., and General Aluminum & Brass Mfg. Co., Detroit, has been appointed general superintendent of the aluminum and brass foundries of the Detroit Aluminum & Brass Corp.

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Joseph Wainwright has been appointed general sales manager of the machinery department of Manning, Maxwell & Moore, Inc., 100 East Forty-second street, New York. Mr. Wainwright was formerly eastern sales manager of the machinery department, having been appointed to that position about a year ago. He has been connected with Manning, Maxwell & Moore Inc. for 18 years, serving successively as manager of the Detroit, Boston and Philadelphia offices.

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Ernest W. Duston, formerly chief engineer of the Blake & Johnson Co., Waterbury, Conn., in its machinery division, has been appointed chief engineer to succeed F. J. Kane, resigned. Mr. Duston has been chief engineer of the American Bolt Corp., Bayonne, N. J., for the past six years. Formerly he was with the Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., Lake Erie Bolt & Nut Co., Cleveland; Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y., and Morgan Construction Co., Worcester, Mass. Mr. Duston is the originator of various patents in cold strip and flat wire machinery.

* * *

George P. Baldwin, general merchandising manager of the General Electric Co, has been elected a vice president of the company with headquarters in New York. He will have charge of activities connected with the electrification of steam railroads and other duties. His headquarters will be in New York.

Charles E. Patterson, vice president in charge of finance since 1920, will take charge of all merchandising activities of the company, including the supervision of comany supply houses. He will make his headquarters at Bridgeport, Conn. The accounting department responsibilies of Mr. Patterson will be assumed by the comptroller, S. L. Whitestone.

Mr. Baldwin, a native of California, was born in San Francisco, Jan. 22, 1874. He graduated from Leland Stanford university in 1896. In 1897 he joined the Stanley Electric Mfg. Co. which in 1903 was bought by the General Electric Co. Mr. Baldwin became vice president of the Blaisdell Co., Los Angeles, where he remained until March 16, 1910, when he was made manager of the Pittsburgh office of the General Electric Co. Dec. 16, 1915, he was made manager of the Atlantic district with headquarters in Philadelphia. When the merchandising department was created in 1923, he was made its first manager.

Mr. Patterson is a native of New York born in April, 1866. He received his degree from Princeton university in 1901. He became comptroller of the American Locomotive Co. After eight years, he became associated with the General Electric Co. and in 1913, when R. E. Steele died, he was elected comptroller, serving until Sept. 10, 1920, when he was elected a vice president.

Workers' Status Best in History

Generally Prosperous Conditions Pointed Out by Secretary Davis in Annual Report—Employment Gains 14 Per Cent, Payrolls 14.5 in Year —Recommends Rotation for Seasonal Workers

WASHINGTON, Dec. 8.—Despite disturbances in the coal industry, such generally prosperous conditions are existing for wage earners as to place them in a more favorable position than at any time in history, it is declared by Secretary of Labor Davis in his annual report to congress.

Wage and employment conditions in the fiscal year ended June 30, Secretary Davis says, indicated an average increase in the volume of employment in the year of 7.4 per cent, while the total payroll advance was 14.5 per cent. Also, the wage level in general has been raised an average per capita of 6.6 per cent.

The secretary urges congress for legislation by which labor could be directed to other industries when it becomes unemployed through the overdevelopment in certain individual lines. This tendency to overdevelopment was cited in the boot and shoe industry, the flour mill industry and the bituminous coal industry.

"Some industries are so overdeveloped that six months' production suffices for a year's supply," says Secretary Davis. "Instead of spreading the six months' work over a whole year of three-day weeks, this labor ought to be bunched and then directed to other industries, where similar conditions prevail, for employment during the remainder of the year." He suggests seasonal employment offices as a remedy. Discussing overdevelopment in the bituminous coal industry in Illinois, Secretary Davis says:

"According to the Illinois coal report, the 338 shipping mines in Illinois operated an average of 139 days. Only three-tenths of 1 per cent operated 270 days or over. Eighty-four of these 338 mines in Illinois, or 24.9 per cent, employing 51.5 per cent of the total persons employed in coal mining in the state, had they operated 300 days, could have produced 77,783,800 tons of coal, which is 7,000,000 tons more than all of the shipping mines did produce, and 5,000,000 tons more than both shipping and local mines produced in 1924. The turnover in the Illinois coal mines is more than 85 per cent, which means that there is 1.85 men in the industry for every job, and that only one man can work, where two must live, with all of his dependents.

"What is needed is some system which will keep going only the coal needed to produce what we need and mines and the manufacturing plants can sell, and needed to keep an adequate number of wage earners employed for 300 days in the year, while the unnecessary mines and plants can be closed or held in reserve. We need some system for scattering unneeded workers in any industry where they really are needed in industry yet to be developed. If this cannot be permitted under the existing laws, then there must be a way of modifying them so as to permit it without incurring any other more serious consequences."

Referring to the alien problem Secretary Davis says:

"Immigration, through the operation of the act of 1924, was reduced, and when compared with the number of petitions for naturalization granted during the same period, we find that our alien population, if not reduced during the year, at least was not increased by any appreciable number. Because of certain preferences in the immigration laws for families of citizens the proportion of naturalization may be increased still further."

Secretary Davis advocates some changes in the immigration laws to permit examinations of prospective immigrants to be made abroad, with immigration placed upon a still more selective basis, together with slight revisions of the quota laws for the benefit of members of families of persons already admitted, and means of controlling smuggling of aliens over the border lines. He also asks authority by law for the suspension of all immigration for a time when employment conditions in this country seem to justify it in the joint opinion of the secretaries of commerce and labor, and also for admission of special immigrants when a shortage of labor develops in the United States, and where like labor cannot be found unemployed, and in cases where no strikes or lockouts exist.

Secretary Davis attacks in strong terms the jurisdictional wage disputes in the building and other industries. "Nothing can do more to destroy the chances of organized labor to deal with large organized industrial interests than these civil wars among the unions," he states. He points out that with the growth of inventions and the use of machinery such disputes threaten to increase. The secretary asks among other things for more funds to make studies to help prevent industrial accidents.

In discussing the child labor amendment, which has failed of indorsement by the states, Secretary declares a great deal of misunderstanding has taken place regarding the proposal for the regulation of employment of minors by the federal government. Where the proper state legislation has not been provided, he believes it is the function of the federal government to regulate such employment, and declares that the issue has not yet been killed. He points out that 33 legislatures of states have voted unfavorably on the amendment in one or both houses, but yet are to vote upon it. He asks congress to enact a new child labor law for the District of Columbia.

Canadian Iron and Steel Output Increased

Toronto, Ont., Dec. 8.—Production of pig iron in Canada during October amounted to 74,013 tons, compared with 34,609 tons in September, and was the heaviest since May, 1924. The increase, while general in all grades was principally in basic pig iron, which rose 140 per cent to 61,379 tons, compared with 25,579 tons in September. Of the total output 81 per cent was made for the further use of the reporting firms.

Production of steel ingots and castings in October amounted to 108,868 tons almost trebling the September output of 37,094 tons. Of the total, 107,195 tons were made for the further use of the producers.

Foreign Ore Purchased

New York, Dec. 8.—Total purchases of iron ore by eastern furnaces in the past month were fully 500,000 tons. The Mystic Iron Works whose furnace near Boston is near completion bought 250,000 to 300,000 tons of North African, Wabana and Swedish. The Bethlehem Steel Corp. closed for foreign manganiferous ore for first half, the reported amount being 25,000 to 50,000 tons. The Reading Iron Co. will buy ore if it decides to light its Hokendauqua furnace.

Inland White Lead Co., Chicago, has increased its capital from $150,000 to $450,000.

"We'll Co-operate," Says Green

President of American Federation of Labor Tells Taylor Society His Organization's Ideal Is Cordial Relations for Mutual Gain—Management Engineers Discuss Personnel Problems

CO-OPERATION was the keynote of the annual meeting of the Taylor society at the Engineering Societies building in New York, Dec. 2 to 5. Co-operation between workers and managers, between the various departments of an organization and between executives was emphasized.

Nowhere was this note more significantly sounded than in the address on "Labor's Ideals Concerning Management" by William Green, president, American Federation of Labor, Thursday evening. Mr. Green said:

"Some of these problems are regularization of employment, fluctuation in prices, standardization of output, healthful and sanitary conditions of employment and the ever-pressing problem of unemployment. Safety of life, the prevention of accidents and continuity of employment make for economy in production costs and promote efficiency in service. These are questions of prime consideration and must be met in the spirit of determination to conquer and control.

"Many of our older concepts are giving way to the newer and more progressive points of view. The relationship of management to labor is changed and is changing. The mental attitude of labor toward industry and industrial processes is undergoing revision and readjustment. Management is understanding more and more that economies in production can be brought about through the co-operation of labor and the establishment of high standards rather than through the autocratic control and exploitation of labor. Labor is understanding more and more that high wages and tolerable conditions of employment can be brought about through excellency in service, the promotion of efficiency and the elimination of waste."

Mr. Green's paper was discussed by prominent engineers, economists and publicists who testified to the significance of the sincere statement he had made and the willingness of management to accept the challenge to co-operation.

A woman engineer, Mrs. Lillian M. Gilbreth, of Frank B. Gilbreth, Inc., speaking at the Thursday afternoon session on "The Present State of Industrial Psychology" emphasized the important contribution of psychology to industry in the securing of profitphasis as possible on the differences of good will.

"A new contribution in this field of the psychology of good will," said Mrs. Gilbreth "is the analysis of emotional situations arising through thwarting instincts, or allowing them too free rein. An emotion thoroughly understood is often half handled. We have special need here for the psychology of the total situation.

"Successful technical and successful group contacts evidence themselves in a satisfactory industrial situation, as measured by the usual production and other plant records."

Labor Willing To Aid Management

CHIEF among the ideals of labor is the development of cordial relations between the workers and management. The workers believe that through understanding and co-operation the best interests of all those associated with industry can be served.

"Labor is vitally and directly interested in the quantity and character of management.

"Labor realizes that the success of management means the success of labor.

"For that reason labor is willing to make its contribution to assist management and to bring about the right solution of problems dealt with by management."
—WILLIAM GREEN, *president, American Federation of Labor, in address to Taylor society.*

Mrs. Gilbreth considered also present practices in selecting and placing workers; in training them for the job, for promotion and for satisfactory adjustment to industrial life; and in developing skill for production activities.

Co-operation was emphasized again in the discussion of "The Relation of the General Manager to His Principal Staff Executives" by the presidents of nine mercantile and manufacturing organizations. All agreed that the chief executive should inspire, inform and lead his staff associates through individual contacts and group conferences, and should co-ordinate their joint participation in carrying out the purposes, policies and plans of the organization.

At the Saturday morning session Fred J. Arthurs, general purchasing agent, Larkin Co., Inc., Buffalo, led the discussion of "Sales Policies and Sales Methods as Appraised by Purchasing Agents." Presiding Officer L. F. Boffey, editor, *The Purchasing Agent*, in summarizing the discussion said:

"What you have been saying comes back to departmental co-operation, co-operation between the purchasing, sales and production departments of the buying organization to regularize its demand; co-operation between the same departments in the selling organization to stabilize its supply of materials."

Other sessions were concerned with "Plant Design and Production Control;" with "Purpose as a Psychological Factor in Management;" and with discussion of the problems of teaching management in commerce and engineering schools.

At the annual business meeting the report of a recent letter ballot showed the following officers re-elected: Percy S. Brown, Corona Typewriter Co., president; Howard Coonley, Walworth Co., vice president; E. W. Clark 3d, E. W. Clarke & Co., treasurer. Lillian M. Gilbreth, and H. K. Hathaway, Industrial Association of San Francisco were elected directors. Other officers are Henry P. Kendall, Kendall Mills, Inc., vice president; C. L. Barnum and Nathaniel G. Burleigh, Amos Tuck school, directors; H. S. Person, managing director, and Ruth Reticker, assistant manager director.

Stress Importance of Defense Plans

(*Concluded from Page* 1500)

James A. Shepard, chairman, read the report of progress made by the materials handling division.

F. D. Campbell, industrial engineer, New York, presented a paper on "Materials Handling Problems and Their Solutions." He recounted experiences in administering for some of the conveyance and handling ills encountered, and pointed out that most manufacturing plants are designed and built without regard for adequate handling of materials of production.

In a paper, "Safety in Materials Handling," D. S. Beyer, Liberty Mutual Insurance Co., Boston, attributed one-third of all industrial accidents to materials handling.

George W. Cope

1847-1925

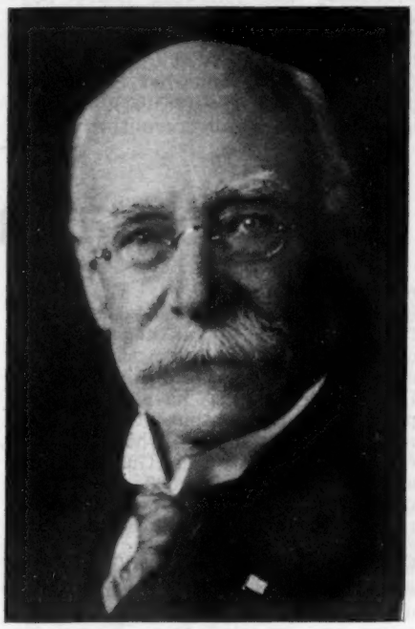
Pioneer of Industrial Journalism

GEORGE W. COPE, until eight years ago managing editor of the *Iron Age*, New York, died at his home in Philadelphia, Dec. 3, aged 78 years. After a generation spent in close contact with the iron and steel trade in various capacities, and after giving the best years of his life of active thought and endeavor to the upbuilding of industrial journalism, Mr. Cope was acclaimed the dean of trade journalists upon his retirement from active connection with the *Iron Age* on May 1, 1917.

Mr. Cope was born on April 9, 1847, at Norristown, Pa. His connection with the iron and steel industry began in 1873 when he entered the service of the American Iron and Steel association at Philadelphia. There he was associated with James M. Swank. At that time the country was producing about 2,500,000 tons of pig iron annually. Mr. Cope watched it grow to about 15 times that size in his 44 years active connection with the industry. While working with Mr. Swank, it was Mr. Cope's duty to meet the iron and steel producers of the country, cultivate their good will and confidence and thus win their co-operation with the association's plans in the upbuilding of the steel industry.

About 1883 Mr. Cope went to New York to become associate editor for the *Iron Age*. He spent two years at that work and returned to the American Iron and Steel association as secretary when Mr. Swank became general manager. In January, 1887, he accepted the appointment of western editor for the *Iron Age* at Chicago. For 15 years he filled the duties of that office with singular success so that in May, 1902 he was called to serve in the home office at New York.

In the succeeding 15 years, most of the time spent as managing editor, in addition he devoted a great deal of his time additionally in important editorial writing, supervising portions of the work in the New York office, and also in charge of the copy-desk. His unflagging attention to detail and his untiring energy that closely approached genius for work were especially characteristic of Mr. Cope. His ideals in trade journalism were always of the loftiest and were faithfully observed. He has left an indelible impress upon the progress and ethics of American trade journalism out of a well-rounded and full life.



GEORGE W. COPE

Obituaries

FRANK J. MC GRATH, general superintendent of Sweet's Steel Co., Williamsport, Pa., died suddenly at his home in Newberry Dec. 2. Mr. McGrath had been ill about two weeks. Up to two weeks ago he was in good health until the recurrence of a malady which attacked him about four years ago. Mr. McGrath was born at Scranton, Pa., 46 years ago. He had been connected with the company for about 12 years, and was well known in iron and steel circles.

* * *

John R. Little, 92 years old, died at his home in Quincy, Ill. last week. He was inventor of a metal wheel generally used on farm implements and heavy machinery. He was head of the Little Metal Wheel Co., Quincy.

* * *

Harry S. Sawyer, superintendent of the Wico Electric Co., West Springfield, Mass., died recently at his home. He was an active member in the Engineering Society of Western Massachusetts.

* * *

Wilbur J. Hawn, superintendent of the Fremont Foundry Co., Fremont, O., since 1920, died at his home there Nov. 26, aged 43. Mr. Hawn has been prominently identified with the foundry industry for the past twenty years having served successively in the Buick Motor Car Co., Flint, Mich., Dodge Bros., Detroit, Fairbanks-Morse Co., Beloit, Wis., and the Henry Miller Foundry Co., Canton, O.

* * *

Albert Bennewitz, production manager of the Cutler-Hammer Mfg. Co., Milwaukee, at its New York works, died recently following a few days illness of double pneumonia, aged 53 years. He was born in Bloomfield, N. J., and had been associated with the Cutler-Hammer company for 23 years, five years as production manager. The company manufactures starters and other electrical equipment.

* * *

Lawrence Henry McWane, president of the Lynchburg Foundry Co., Lynchburg, Va., cast iron pipe maker, died there Nov. 23 of pneumonia, aged 42 years. Mr. McWane entered the foundry industry immediately after leaving college. He was manager of the company's Radford plant, and general manager of the Lynchburg plant before succeeding his father as president in 1914.

May Lift Receivership

Lifting the receivership and the sale of the plants of the Hydraulic Steel Co., Cleveland, are the aims of an agreement reached by the reorganization committee and the preferred stockholders committee at Philadelphia recently. Letters have been sent to preferred stockholders advising them of the agreement and urging them to deposit their stock with the Guardian Trust Co., Cleveland by Dec. 10. In addition a petition for the sale of the company's plants has been filed in federal court, the hearing upon which has been set for Dec. 12.

British Steel Gain Is Real but Slight

(*Concluded from Page* 1493)

Most descriptions of finished steel are slightly cheaper. Sections can be bought in Birmingham under £7 ($33.88) per ton and plates below £8 ($38.72). Steel bars, largely re-rolled from continental material are cheaper at £7 15s ($37.51). The continued use of foreign raw material by the re-rollers has a depressing influence on business with home steelworks, making their steel from pig iron. Joists can readily be bought at £7 2s 6d ($34.48) per ton. As foreign products of this kind can be bought at £6 7s 6d ($30.85) delivered a lot of this material is still being used in extensive building operations.

The depression of British steel prices is giving the British steel manufacturer a better command of the home market, and there should be considerable reduction in the November import returns on the lower figures reported for October. English billets continue at £6 2s 6d ($29.64) delivered in Birmingham as against £5 5s ($25.41) to £5 7s 6d ($26.01) for Belgian steel. Importing merchants report a decided falling off in imports from the Continent. There is talk among steelmakers of an effort to arrive at some understanding as to selling prices, with a view to eliminating the present ruthless competition, but very little hope is entertained of success in this direction. The decided improvement in the galvanized sheet and tin plate trade finds a useful market for the Welsh steelworks for tin and sheet bars.

The galvanized sheet trade is busy with orders falling into arrear, the North of England and Scotland finding this department among the most active. The new business, however, has not been quite so voluminous lately, though this is regarded merely as the customary lull following heavy buying. The orders booked now are for January and February delivery, but the basis remains at £16 12s 6d ($80.46) with a somewhat larger proportion at £16 15s ($81.07). Similarly, in the tin plate trade the volume of new business has fallen off slightly, but is still sufficient to maintain the £1 ($4.84) per box basis. It is understood that the tin plate trade is operating at about 85 per cent capacity.

British Export Prices Tending Lower

London, Dec. 1.—(*European Staff Service*)—The Board of Trade returns for October, 1925, give the average British export prices per gross ton for a certain number of iron and steel products. These prices are compiled from actual contracts which were made several months ago and this accounts for the difference between the present quotations and the base prices regularly quoted in these columns.

	£	s	d	$
Foundry pig iron	3	19	0	19.11
Ferromanganese	18	5	7	88.64
Carbon billets	13	13	0	66.17
Beams	9	4	9	44.79
Galvanized sheets	18	14	0	90.66
Tinplate	20	18	0	101.32
Plates	10	15	2	52.10

Competition Hits German Steel Mills

BERLIN, Dec. 1. — (*European Staff Service*)—German export business is slack as German prices are too high to compete against French and Belgian prices. The shape union declines to book any more foreign orders as export prices are causing too heavy losses. Export prices for bars are about £5 6s ($25.60), but although there is sufficient demand from Japan, India and South America only a few orders are booked. Business in rails has improved and recently the Ferrostahl Co. booked a foreign order for 3000 tons.

The shortage of capital continues to handicap the German iron and steel trade. The raw steel union has curtailed output to 65 per cent of capacity, but even this reduced production cannot be placed with consumers, as many cheap offers are still made. It is even anticipated that the syndicates will cut their official prices for bars and structural shapes next month. France is offering material at low prices in increasing quantities, and there is no doubt the heavy advance of German imports during recent weeks is especially due to dumping of French material on the German market. German imports of pig iron increased from 7100 metric tons in February to 19,800 tons in September, of semifinished products from 6600 tons to 23,900 tons, and of bars from 13,000 tons to 30,700 tons. Stocks at the works have accumulated in consequence. Stocks of pig iron increased from 203,000 metric tons in February to 435,000 tons in July and 387,000 tons in September.

Domestic consumers are reluctant to buy and the market is depressed. The Phoenix Co. is shutting down its Dusseldorf plants and is stopping its production of pipe, which means a dismissal of 3000 workers. The Borsig Co. reports a bad situation during recent months and the locomotive business is particularly slack. The Hoesch Steel Works have reduced their force from 9700 to 6850 and have curtailed output by 35 per cent; they cannot even place this reduced tonnage. The Hennigsdorf works have been compelled to reduce output of their sheet mill, the capacity of which is 3000 tons a month. The Gutehoffnungshuette will dismiss 500 workers in its rolling mills. Krupps deny the reports that they have received great concessions of manganese ores and bauxite in Montenegro. On the other hand, orders for the construction of eight bridges on reparations account are expected from Yugoslavia. Thyssen has blown in its fifth blast furnace. Negotiations as to the formation of the Rhenanian-Westphalian steel trust are progressing, but the question of government taxes has not yet been cleared up.

German output of steel ingots and castings increased from 879,571 metric tons in September to 928,339 tons in October, compared with 981,000 tons which was the monthly average of 1913 in the present boundaries. Pig iron production shows an advance from 734,935 tons in September to 741,741 tons in October, against 910,000 tons, the 1913 monthly average. Furnaces in blast decreased from 96 Sept. 30 to 93 Oct. 31. Production of rolled products in October totaled 772,547 tons against 777,480 tons in September.

The domestic pig iron market is depressed as considerable tonnages of French, Indian and English material are imported. In order to increase its sales the pig iron union now is granting an export bounty of six marks ($1.43) per ton on pig iron exported in the shape of finished products. Exports of pig iron have somewhat increased. Domestic business in ferromanganese is dull and the four existing German producers are operating at a limited rate. However, they have no stocks on hand as they are producing only as orders come in. Exports of ferromanganese have revived, especially to Czecho-Slovakia, Poland and Austria. There exists a convention between German, English and Norwegian producers which has fixed the price at £14 ($68) c.i.f. Hamburg.

Luxemburg Does Well

Brussels, Dec. 1.—(*European Staff Service*)—Production of iron and steel in Luxemburg during September was continued at a high rate and, although it did not reach the July record, remained well above the average since 1913.

The output of pig iron was 195,799 metric tons, compared with 201,896 tons in August and 202,546 tons in July. This included 190,269 tons of basic bessemer pig iron, 3150 tons of foundry and 2380 tons of gray forge.

Production of steel ingots and castings in September was 180,289 metric tons, against 173,522 tons in August and 183,969 tons in July. September production included 176,920 tons of basic bessemer steel, 2745 tons of open-hearth steel, and 574 tons of electric steel. Monthly production figures are shown in the following table, in metric tons:

Mon. ave.	Pig iron	Steel ingots and castings
1913	212,320	*110,500
1922	139,945	116,165
1923	177,220	100,100
1924	181,100	157,195
1925		
January	197,430	170,856
February	176,514	157,227
March	198,737	178,367
April	187,193	167,143
May	189,747	167,137
June	190,073	171,025
July	202,546	183,969
August	201,896	173,522
September	195,799	180,289

*Ingots only.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

INTERNATIONAL COMBUSTION ENGINEERING CORP., New York has taken over the Ladd Water Tube Boiler Co. and the Lopulco Systems Inc. Directors of the former have authorized issuance of 175,000 new shares to be exchanged for the 77,500 shares of the Ladd stock and 4900 shares of Lopulco stock. The Ladd Water Tube Boiler Co. was incorporated Nov. 10 in Delaware to manufacture stationary steam boilers and acquired licenses under patents owned by the George T. Ladd Co., a New Jersey corporation. A plant will be built to manufacture this type of boiler.

* * *

AMERICAN CLOSET VALVE CO., Mars Hill, Ind., has moved part of its production activities into a new building made necessary by increased demand for its goods.

* * *

THE NORTON CO., abrasives, Worcester, Mass., has bought the 2-story and basement machinery salesroom at 9 and 11 North Jefferson street, Chicago, part of which it occupies.

* * *

MILWAUKEE DIE CASTING CO., 295 Fourth street, Milwaukee, has bought 50 x 150 feet adjoining its plant and will adapt the buildings on the lot to its uses.

* * *

THE Northern Engineering Works, Detroit, which has concentrated on crane selling for two years past, is preparing to resume the sale of foundry equipment on a large scale. It will be able to equip foundries complete with the exception of molding machines and sand mixers. Included in the list of equipment it is offering are: Cupolas, tumbling barrels, ladles of all kinds, industrial turn-tables, shop trucks, pneumatic hoists, electric hoists, core oven cars, overhead monorail systems, and I-beam trolleys. It also will continue to sell overhead cranes.

* * *

WILLIAM A. FALLS, Detroit, Mich., representing eastern capitalists, has purchased the Barbee Wire & Iron Works, Lafayette, Ind., at a federal court auction for $125,000. The company went into receivership last April 10. Six groups of capitalists were represented at the auction. The factory has been in continuous operation since bankruptcy proceedings were started and has shown a profit, the stockholders receiving a dividend and an additional surplus being built up.

* * *

J. I. CASE THRESHING MACHINE CO., Racine, Wis., has developed a machine for removal of snow from highways, under a patent by Wallace F. McGregor, assigned to the company. The machine will be given road tests the coming winter, before production is undertaken.

* * *

BAY CITY ELECTRIC STEEL CASTINGS CO., Bay City, Mich., has installed a 45-foot span, five-ton, electric controlled crane and is placing an air compressor, two core ovens and a 5-ton capacity annealing oven. S. S. Fair and E. M. Mills are owners of the company.

* * *

OPERATIONS are to start Jan. 1 in the plant of the Nee-Wat Method, Inc., 1327 Pine street, St. Louis, recently incorporated for $100,000. The company will manufacture apparatus which will remove scale rust by a patent electric method. George Hessenbruch is president, H. Kroemer, vice president and A. Dundon, secretary.

* * *

LAUREL MOTORS CORP., Anderson, Ind., has been taken over by a syndicate of St. Louis men, who have elected officers, as follows: Arthur S. Sinclair president, Charles Teutenberg vice president, Norman H. Winters secretary and treasurer and R. M. Roof chief engineer. William Schnarr and William Winters are directors.

* * *

NEGOTIATIONS are about completed for the purchase of the Michigan Stove Co. by the Detroit Stove Works, both of Detroit. In the new organization, William T. Barbour, president of the Detroit Stove Works, will be the executive head. Detroit Stove Works was organized in 1870 by Mr. Barbour's grandfather, the late William H. Teft, who with the late Jeremiah Dwyer put the earlier stove business of J. Dwyer & Bro. into corporate form. There was an early disagreement and Jeremiah Dwyer, in company with M. I. Mills, Charles du Charme, Francis Palms and others, formed the Michigan Stove Co. The Detroit Stove Works recently purchased the Art Stove Co., Detroit.

* * *

THE H. M. MYERS SHOVEL CO., Beaver Falls, Pa., will be consolidated with the Ames Shovel & Tool Co., Anderson, Ind. Work of Dismantling the Beaver Falls plant has been started. A one-piece shovel was made at the Pennsylvania plant. Harry Myers, manager of the Beaver Falls plant will be transferred to the sales department of the consolidated organization.

* * *

NEWTON FOUNDRY CO. has obtained an option on the plant of the Semi-Steel Foundry Co., Barberton, O., and will start operations shortly. A. M. Hall, for 16 years superintendent of the foundry of the Wellman-Seaver-Morgan Co. has been made president, Oscar Hackenburg vice president, J. C. Donald secretary and J. C. Bins treasurer. Gray iron castings up to five tons will be turned out.

* * *

REPS HEATING CO., Clyde, O., has been formed by H. P. Repetto, Fremont, O., sales manager of the Fremont Stove Co., and has leased the plant of the former Elmore Automobile Co. at Clyde. A gasoline stove of new design will be manufactured. Space has been leased in the plant of the Elmore Automobile Co., from the Vitrified Iron Products Co., which occupies it. The latter company will enamel products of the new firm.

* * *

THOMAS COX & SONS MACHINERY CO., Little Rock, Ark., has sold its business and properties to the Central Supply Co. and J. H. Hollis & Co. Officers and employes will be retained by the purchasing companies. The company was founded in 1876, incorporated for $25,000. In 1907 capitalization was increased to $50,000 and in 1920 to $100,000 common and $50,000 preferred. C. C. Rose is president of the Central Supply Co. and J. H. Hollis of J. H. Hollis & Co.

Pre-Inventory Lull Hits Jobbers

Prices Maintain Advances of Recent Weeks—1925 Sales Total High

PRE-INVENTORY buying dullness is being anticipated in the the iron and steel warehouse market. In some districts, however, sales during the past week were heavier than in October. Prices are firm, few alterations of the list being made.

Considering seasonal influence business in the New York metropolitan warehouse district is unusually good. A particular demand prevails for shapes, bars and sheets, with a feature the fact that black sheets now are moving as briskly as galvanized sheets. Prices appear on the firmest basis in some time, no change being made in the past two weeks.

New extras on cold-rolled stock have been established by Cincinnati warehouses. These do not affect prices. Demand centers on bars, sheets and plates. Structurals are lagging. Bars are quoted 3.30c and structurals and plates 3.40c warehouse.

St. Louis warehouse business continues satisfactory, but with building materials making relatively the best showing for this season. Standard structural shapes, nails, rods and other building materials are selling in quantity unusual this late in the season.

Jobbers at Philadelphia report December bookings exceeding those of November. October daily average was the best this year. While no speculative buying is being done, jobbers now are specifying four to five months ahead. Some shading is noted but the market is firmer than usual.

Sales by Cleveland jobbers are heavier than in November. Daily average business is better than in October, the heaviest month of the year, several jobbers report. Prices are firmer, less stringent shading being encountered, although $1 to $2 a ton concessions still are customary for attractive business.

Competition for warehouse business in wire nails continues marked at Chicago and affords the weakness in prices. Demand is well diversified, with sheets possibly above the average. Prices generally are unchanged.

Detroit warehouse demand continues brisk. Operators report the drain upon stock is being felt by some small houses. Delays in mill deliveries continue to turn considerable business to warehouses. Prices are unchanged and very firm.

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.10c
Detroit	3.15c
Los Angeles	3.05c
New York	3.24c
Philadelphia	3.05c to 3.20c
Pittsburgh	2.90c
Portland	2.85c
San Francisco	3.30c
Seattle	3.25c
St. Louis	3.15c
St. Paul	3.25c

IRON BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
New York	3.24c
Philadelphia	3.05c to 3.20c
St. Louis	3.25c

REINFORCING BARS

Boston	3.265c to 3.50c
Buffalo	3.30c
Chicago, billet	2.60c
Chicago, rail steel	2.00c to 2.10c
Cincinnati	3.30c
Cleveland	2.85c to 3.10c
Detroit	3.15c
Los Angeles, C. L.	3.05c
Los Angeles, L. C. L.	3.30c
New York	2.95c to 3.15c
Philadelphia	3.00c to 3.25c
Pittsburgh	2.50c to 2.60c
San Francisco, C. L.	3.35c
San Francisco, L. C. L.	3.80c
Seattle	3.50c
Youngstown	2.50c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.20c
Detroit	3.25c
Los Angeles	3.05c
New York	3.34c
Philadelphia	2.60c to 3.20c
Pittsburgh	3.00c
Portland	2.85c
San Francisco	3.30c
Seattle	3.35c
St. Louis	3.25c
St. Paul	3.35c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.20c
Cleveland, 3/16-inch	3.425c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Los Angeles	3.15c
New York	3.34c
Philadelphia	2.60c to 3.20c
Philadelphia, 3/16-inch	2.80c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.25c
St. Louis	3.25c
St. Paul	3.35c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	3.915c
Buffalo	3.90c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.15c
Detroit	3.65c
Los Angeles	3.70c
New York	3.89c
Portland	4.25c
Philadelphia	3.50c
San Francisco	3.75c
Seattle	4.50c
St. Louis	3.65c
St. Paul	3.75c

NO. 28 BLACK SHEETS

Boston	5.25c
Buffalo	4.60c
Chicago	4.10c
Cincinnati	4.55c
Cleveland	3.95c
Detroit	4.25c
Los Angeles	4.75c
New York	4.35c
Philadelphia	4.65c
Portland	5.50c
San Francisco	4.75c
Seattle	5.50c
St. Louis	4.60c
St. Paul	4.35c

NO. 28 GALVANIZED SHEETS

Boston	6.25c
Buffalo	5.90c
Chicago	5.25c
Cincinnati	5.65c
Cleveland	5.10c
Detroit	5.50c
Los Angeles (corr. 28 ga.)	6.00c
New York	5.50c
Philadelphia	5.85c
Portland	6.25c
San Francisco	6.00c
Seattle	6.50c
St. Louis	5.70c
St. Paul	5.50c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.85c
Detroit	3.80c
Los Angeles	3.90c
New York	3.99c
Philadelphia	3.90c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.25c
St. Paul	3.90c

HOOPS

Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cleveland	3.85c
Detroit	4.30c
New York	4.49c
Philadelphia	4.25c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds and hexagons	Flats and squares
Boston	4.05c	4.55c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.90c	4.40c
Detroit	3.75c	4.25c
Los Angeles	5.25c*	.....
New York	4.00c	4.50c
Philadelphia	4.00c	4.50c
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	3.75c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....

*Rounds only.

COLD ROLLED STRIP

Boston, .100 inch, 500 lb. lots	6.30c
Buffalo	6.35c
Chicago	6.25c
Cincinnati	7.15c
Cleveland, over 500 pound lots	5.95c
Detroit	6.20c
New York	6.25c
Philadelphia	6.25c
Pittsburgh	6.30c

FOREIGN IRON AND STEEL

New York, duty paid

Swedish hollow drill steel	15.00c
Swedish iron bars round	6.75c
Flats and squares	7.00c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe

WROUGHT STEEL PIPE

	Black	Galvanized
⅛-inch butt	—23	+21
¼ to ⅜-inch butt	—36	— 3
½-inch butt	—46	—29
¾-inch butt	—51	—37
1 to 3-inch butt	—53	—39
2-inch lap	—40	—22
2½ to 6 inch lap	—48	—35
7 and 8-inch lap	—44	—17
9 and 10-inch lap	—38	—14
11 and 12-inch lap	—37	—13

WROUGHT IRON PIPE

	Black	Galvanized
⅛ to ⅜-inch butt	+44%	+78%
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1 to 1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
2½-inch lap	— 9	+ 9
3 to 6-inch lap	— 3	+ 6
7 to 12-inch lap	— 3	+16

Foreign Trade Bureau Broadens

Further Steps To Increase Facilities for United States Manufacturers and Industries Planned by Iron and Steel Division, Department of Commerce—Review of Activities Presented in Report to Secretary Hoover

WASHINGTON, Dec. 8.—Further important steps in the broadening of its facilities, both domestic and foreign, as a service to the iron and steel and other industries is being planned by the bureau of foreign and domestic commerce, according to the annual report of the bureau, covering the fiscal year ended June 30, 1925, by Dr. Julius Klein, director. The report has just been presented to Secretary of Commerce Hoover.

In discussing this part of the report, Dr. Klein says the great need now is for further amplifying the field services, the district offices in the United States and the foreign trade posts. Then a more comprehensive gathering of business and trade facts may be accomplished, with a more effective distribution of these facts in the United States. "Only in this way," Dr. Klein says, "can our exporters be assured of a genuinely secure and permanent position in the world's markets." Services inaugurated in the iron and steel division of the bureau during the year are cited as follows:

Studies were made of the trade in metal lath, alloy steel bars, horseshoes and horseshoe nails, card clothing, wood screws, and other steel specialties, and the results were distributed in mimeographed form to the interested manufacturers.

The world's leading markets for iron and steel products were analyzed for exporters.

Graphs and charts were made to show the world's production of pig iron and ingot steel by countries and the United States' position in respect to exports of iron and steel in comparison with other steel producing countries.

Outlines were prepared for the direction of the bureau's foreign service men in their investigations of subjects of vital interest to American manufacturers of iron, steel and hardware. These included surveys on cast iron pipe, alloy and tool steels, a shoring device used in concrete building construction, a derailing device, tool grinders, abrasive grains, cast aluminum ware, builders' hardware, water filters, fly screens, expansion units, vault doors, oil-pressure stoves, restaurant and hotel equipment, and other hardware items.

Trade information bulletins issued by the division have included "Italy's Foreign Trade in Iron and Steel," "Austrian Iron and Steel Industry and Trade," "Canadian Iron and Steel Industry," and "World Trade in Chromite."

"Despite the keenest kind of competition from Europe," says the report, "the American Iron and steel and hardware manufacturers managed to maintain their position in the world's markets during the fiscal year. Iron and steel mill products were shipped abroad to the amount of more than $200,000,000, while the aggregate for hardware and allied lines was about $60,000,000. The iron and steel division, co-operating with the government's foreign agents and the bureau's district and co-operative offices, helped in large measure toward realizing these results."

Machining Section Active

It is pointed out in the report that the work of the industrial machinery division in the fiscal year has been largely in assisting American manufacturers in handling their export problems, especially to find better channels in all foreign markets.

Early in the year the chief of the machinery division, W. H. Rastall, went to Europe to study the machinery markets there and after the investigation was completed the results were made available to American machinery manufacturers. The bureau's representatives in these foreign countries are continuing the work in machinery market investigation, and additional information has been coming in.

It is stated also that exports of agricultural implements, which amounted to about $60,000,000 in the fiscal year, were larger than in any other year in which the agricultural implements division has been in existence. The division maintained its principal contact with the National Association of Farm Equipment Manufacturers and strengthened and extended its contacts with individual companies. Increasing interest in foreign trade is being shown by the farm implement producers.

Important foreign trade opportunities to individuals, and published statements, some of this being reserved information, were furnished by the bureau of foreign and domestic commerce during the year. At the end of the fiscal year, the bureau was supplying service in more than 7200 cases daily.

American Manufacturers Use Commerce Service

Washington, Dec. 8.—American manufacturers are realizing the increasing importance of commercial information from foreign areas upon which the United States depends for its essential raw materials, according to Dr. Julius Klein, director of the bureau of foreign and domestic commerce in his annual report to Secretary Hoover. Calls for trade information in the past year totaled more than 2,000,000 and now are averaging more than in the past. Citing practical results from Jan. 1 to May 6, 1926, Dr. Klein reports that 100 companies of 18,500 served, voluntarily reported increases in business aggregating $70,000,0000. Total foreign trade, imports and exports, were valued at more than $8,600,000,000 during the past year.

By comparison with the five-year prewar average, merchandise exports have increased 124.6 per cent and imports 126.4 per cent. Compared with 1924, exports have gained 12.8 per cent and imports 7.6 per cent. Total foreign trade of the United States gained more than 30 per cent since 1913. Commenting on the steel foreign trade, Dr. Klein said: "The steel industry now is operating close to 100 per cent of capacity and is maintaining its position in export markets notwithstanding reviving European competition."

During the fiscal year our foreign trade with all continents except Asia increased in value. Exports to South America advanced 28 per cent in consequence of increased shipments of manufactured products, and those to Europe increased 21 per cent due to heavy shipments of grain and cotton. Our exports to the Far East declined, obviously due to political disturbances. Imports from all three of these areas increased in value during the year.

Referring to some of the services rendered by the bureau in the promotion of foreign trade, Dr. Klein states that during the year special

trade information circulars increased over 600,000 to a total of 3,713,000. The bureau's directory of foreign buyers was increased by 57,700 new reports, bringing the total to 200,000. Requests were received for nearly 50,000 in the fiscal year 1924—an increase of 72 per cent in one year. In addition, a total of 43,294 special reports, economic and trade notes, and informational letters were received from the bureau's foreign service, against 29,920 during the preceding year. In concluding the report, Dr. Klein states that it seems desirable to stress the significant fact that the service rendered by the bureau's organiation has advanced out of all proportion to the amounts which have been provided for carrying on its work. The increase in outlay for the new fiscal year 1925-26 over the year 1924-25 is only a little more than 5 per cent, while the amount of work performed is climbing at the rate of more than 70 per cent a year.

Organize for Open Shop

Los Angeles, Dec. 5.—Business interests of Santa Barbara have organized an open shop committee, as a unit of the Employers' Council of Southern California, to resist trade union demands in rebuilding that portion of the city wrecked by earthquake. Trade unions are held responsible for putting obstacles in the way of reconstruction, forcing all wages 25 per cent above those in Los Angeles and other southern California cities. The rebuilding program calls for an outlay of about $15,000,000, and contractors say $1,000,000 wil be saved through open shop work.

Mill Scrap Specifications Proposed

TENTATIVE specifications for iron and steel scrap for rolling mills have been prepared by the iron and steel committee of the National Association of Purchasing Agents and will be considered at a conference to be called by the bureau of standards at Washington in January. After consideration and revision by this conference these specifications will be proposed for incorporation in the standard classification adopted a few months ago by the association.

A standard form of purchase contract also has been formulated and will be discussed at the same conference, in an effort to obtain uniformity in this respect.

Criticism and suggestion for changes in the proposed classification are desired by the committee and may be addressed to Russell Forbes, assistant secretary of the association, Woolworth building, New York.

The proposed specification for scrap for rolling mills is as follows:

1. IRON AXLES

Iron railroad car axles; M. C. B. sizes, free from locomotive axles and defective or imperfect forgings.

2. STEEL AXLES

Steel railroad car axles; M. C. B. sizes, free from locomotive axles and defective or imperfect forgings.

3. IRON RAILS

Standard section tee rails, original weight 50 lbs. per yard or heavier, minimum length 4 feet; free from frog, guard, switch, curved and turntable rails.

4. STEEL RAILS

Standard section tee rails, 50 lbs. per yard yard and heavier, five feet long and over. Suitable for re-rolling. Free from bent and twisted rails, frog, switch and guard rails and rails with split heads and broken flanges.

5. SHAFTING

Iron and soft steel, 1½ inches to 8 inches round and square; 4 feet and longer in straight bars.

6. ARCH BARS

Iron railroad arch bars and transom bars.

7. IRON ANGLE OR SPLICE BARS

Wrought iron—50% to be whole bars.

8. NO. 1 RAILROAD WROUGHT

Heavy wrought iron from railroad shops and cars, 6 inches and longer, including iron links and pins; flats ¼ inch thick and over; rounds and squares, ⅝ inch thick and over; free from any attachments.

9. NO. 2 RAILROAD WROUGHT AND TRACK SCRAP

Heavy wrought iron and soft steel scrap from railroad shops and cars, from 2 inches to 6 inches long, but including track bolts, spikes and nuts. All to be free from steel shapes and plates.

10. CUT FORGE

Iron and soft steel scrap suitable for piling purposes without further preparation. Material to be ⅝ inches or heavier, 4 inches or narrower and not over 26 inches in length or shorter than 2 inches. May include wagon tire if cut into 6 inch lengths or shorter; also horse shoes if cut into 3 pieces. Must be straight and flat; also free from plate, sheet, hoop and washer scrap punchings and similar material.

11. SHOP SCRAP

Wrought and soft steel bar, shape and plate ends, punchings and shearings, free from curly clippings and hard steel, all suitable for fagoting.

12. NO. 1 BUSHELING

Iron and sofe pipes and flues (clean), tank and bands No. 12 and heavier, boiler plate punchings and clippings, and soft steel and iron drop forgings and trimmings; nothing to be over 8 inches long or wide, free from galvanized or tinned stock. All steel must be under .12 carbon.

13. NO. 2 BUSHELING

Cut hoops, cotton ties and similar light material; nothing to be over 8 inches long or wide; free from dirt, galvanized or tinned material, or other similar inferior scrap.

14. PIPES AND FLUES

Wrought and soft steel. Must be free from dirt or lime and from riveted seams; nothing over 6 inches in diameter.

15. NO. 1 MILL

Iron and soft steel bars not less than ⅜ inch round or square and flats no thinner than No. 12 wire gage, including heavy railroad sheet; tank in separate sheets and rings, boiler sheet and rings, clean pipes and flues, heavy punchings and clippings and strictly soft steel agricultural implement shapes. All steel must be under .12 carbon.

16. NO. 2 MILL

Iron and soft steel hoops and sheets, railroad sheet, cotton tie clippings and ties, skeleton sheet scrap and iron too light for No. 1 mill; free from galvanized, tinned or badly rusted material.

17. NO. 1 RAILROAD SHEET

To be under ¼ inches thick consisting of cut smoke stacks, hoops, band iron and steel, pressed steel hand car wheels, scoops and shovels, free of wood, wire, rope, cushions and other similar springs and lime-encrusted pipe and flues from boilers. Must be free from galvanized iron or tin.

18. AXLE TURNINGS

Wrought iron and steel railroad car axles, turnings and chips; free from tire turnings.

19. TURNINGS

Machine wrought and steel, clean and free from borings and drillings, other metals, dirt, lumps and badly tangled material.

20. DRILLINGS

Wrought or soft steel, clean and free from other metals, dirt and lumps.

21. MIXED BORINGS AND TURNINGS, AND CAST BORINGS

Clean, and free from other metals, dirt and lumps.

22. NO. 1 CAST IRON

To be all clean cast iron scrap, nothing under 10 lbs. in weight, nor over 48 inches long or 18 wide. To contain no brake shoes, cast iron soil or drainpipe, cast iron columns, stove scrap or burned iron of any description and to be free from steel parts.

23. NO. 1 BOILER CUT

Boiler sheets and rings and riveted flues not under 16 iches in diameter, all rivets cut, no single piece to weigh over 500 lbs.

24. BUNDLED SHEET

Bundled skeleton, bundled cotton ties or wool ties in bundles not over 18 inches in diameter and 30 inches long; tied so they will not come apart, but not tightly compressed; free of metals.

NOTE:

Material on all of above grades unless otherwise specified, must be free from high carbon or alloy steel.

Soft steel here mentioned is considered to mean 0.20 carbon and under.

Current Statistics of Industry

Production of Malleable Castings Larger

Washington, Dec. 8.—Production of malleable castings totaled 68,234 tons in October, compared with 58,573 tons in September, and 50,066 tons in October 1924, as reported to the department of commerce by 142 plants. Shipments and bookings also increased. Shops were operated at 60.6 per cent of capacity in October compared with 51.3 per cent in September and 43.8 per cent in October 1924. Further comparisons follow:

1924	Total tons produced	Per cent of capacity	Total tons booked	Monthly capacity
October	50,066***	43.8	54,589	114,264
November	47,987**	42.5	48,866	113,011
December	58,773****	50.9	46,541	115,474
1925				
January	66,367****	57.6	61,140	115,179
February	60,220**	53.0	49,673	113,530
March	61,245**	53.5	56,481	114,506
April	62,962***	55.1	58,001	114,195
May	61,003***	53.9	50,594	113,260
June	58,881***	51.5	47,303	114,284
July	57,229**	50.2	56,933	114,144
August	56,829***	49.6	48,691	114,455
September	58,573	51.3	49,832	114,217
October	68,234***	60.6	65,495	112,609

**Includes 4 plants reported idle.
***Includes 5 plants reported idle.
****Includes 6 plants reported idle.

Stoker Sales Lower

Washington, Dec. 8.—Sales of mechanical stokers in October totaled 114, compared with 119 in September and 104 in October 1924, according to reports to the department of commerce from 13 establishments. Of the 114, 22 were for fire tube and 92 for water tube installation. Further comparisons follow:

	Stokers sold	Fire tube boilers	Water tube boilers
1923 Total	1464	177	1287
August	94	17	77
September	73	27	46
October	104	7	97
November	106	11	95
December	91	18	73
1924 Total	1128	161	967
January	57	4	53
February	135	28	107
March	131	17	114
April	120	23	97
May	122	23	99
June	128	26	102
July	147	30	117
August	91	27	64
September	119	34	85
October	114	22	92

Babbitt Sales Heavier

Washington, Dec. 8.—Total apparent consumption of babbitt metal in October amounted to 5,550,247 pounds, the highest monthly figure since March, according to reports to the department of commerce from 27 manufacturers. Sales by manufacturers totaled 4,169,870 pounds, and consumption by producers 1,380,377 pounds. Following are further statistics:

1925	Total apparent consumption	Sales by manufacturers	Consumption by producers
January	5,683,182	4,620,814	1,062,368
February	5,164,619	4,103,340	1,061,279
March	5,644,288	4,395,901	1,248,387
April	5,126,415	3,928,135	1,198,280
May	5,081,667	4,189,557	892,110
June	5,034,965	4,085,124	949,841
July	5,074,966	3,694,386	1,489,810
August	5,441,823	4,068,706	1,373,117
September	4,621,033	3,579,780	1,041,253
October	5,550,247	4,169,870	1,380,377
Total (10 mos.)	52,572,439	40,835,617	11,736,822

Steel Furniture Sales Highest Since January

Washington, Dec. 8.—Orders received for steel furniture from the business group in October were valued at $2,170,076, the highest since January, according to reports to the department of commerce from 32 manufacturers. Shelving orders aggregated a value of $730,911 as reported by 15 companies. Shipments in both classifications were unusually high although unfilled orders in the business group dropped. Following are further comparisons:

	Totals
1919	$10,895,203
1920	17,659,303
1921	14,327,830
1922	12,928,026
1923	16,834,029
1924	17,381,252

Business Group

1924	Orders received	Shipments	Unfilled orders
October	1,761,431	1,783,162	1,184,731
November	1,615,912	1,678,636	1,216,144
December	1,914,038	1,872,677	1,220,232
1925			
January	2,206,952	1,972,137	1,455,890
February	1,986,151	1,939,097	1,501,460
March	2,012,322	2,027,863	1,482,859
April	1,964,959	2,009,199	1,466,428
May	1,855,552	1,918,869	1,383,424
June	1,792,656	1,805,599	1,390,540
July	1,823,435	1,810,754	1,445,897
August	1,664,649	1,688,965	1,358,386
September	1,969,769	1,816,484	1,535,231
October	2,170,076	2,130,498	1,406,117

Shelving

1925			
March	$ 606,754	$ 539,972	$ 515,434
April	566,834	650,769	436,048
May	523,426	549,272	372,296
June	501,182	514,117	360,089
July	510,815	482,187	398,973
August	516,694	452,716	447,255
September	624,676	542,173	511,689
October	730,911	622,471	626,933

A petition in bankruptcy has been filed against the A. B. C. Iron Works, Inc., 550 Barretta street, New York and a receiver appointed.

Steel Castings Bookings Best Since February

Washington, Dec. 8.—Bookings of commercial steel castings in October, totaling 61,044 were the best since February when 61,535 tons was booked, according to reports to the department of commerce from principal manufacturers representing over two-thirds the commercial castings capacity of the United States. Bookings were at 60.8 per cent of capacity, compared with 48.6 per cent in September. Further comparisons follow:

	Total net ton	Per cent capacity	Railway specialties net tons	Miscellaneous net tons
1922 totals	812,741	69.6	404,682	408,059
1923 totals	894,780	74.6	386,939	507,841
1923 mo. av.	74,565	74.05	32,245	42,320
1924 totals	772,840	64.1	388,357	384,483
1924 mo. av	64,403	64.1	32,363	32,040
1924				
October	66,697	66.4	31,130	35,567
Total (10 mos.)	602,456	.....	293,682	308,774
November	74,220	73.9	41,343	32,877
December	96,164	95.8	53,332	42,832
1925				
January	82,922	82.6	40,799	42,123
February	61,535	61.3	27,237	34,298
March	59,508	59.3	21,670	37,838
April	59,008	58.8	22,109	36,899
May	49,619	49.4	16,055	33,564
June	48,413	48.2	16,675	31,738
July	54,474	54.2	19,953	34,521
August	51,358	51.2	18,235	33,123
September	48,827	48.6	17,008	31,819
October	61,044	60.8	20,576	40,468
Total (10 mos.)	576,708	.....	220,317	356,391

Steel Barrel Output High

Washington, Dec. 8.—October's total of 553,545 steel barrels manufactured was the best since May when 570,962 were produced, according to data from 31 establishments to the department of commerce. Shipments also were the highest since May. Further comparisons of production, shipments and unfilled orders, follow:

	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
1924				
October	447,900	441,900	238,426	444,107
November	391,401	389,230	549,188	681,620
December	413,785	407,474	312,502	1,275,532
1925				
January	420,127	415,040	345,696	1,028,551
February	413,823	407,781	313,544	1,022,580
March	505,429	510,928	399,940	864,920
April	594,971	605,424	411,053	726,499
May	570,962	569,670	313,123	637,230
June	514,913	508,880	269,964	582,630
July	497,152	506,894	314,727	974,656
August	498,449	495,736	263,588	851,079
September	510,869	503,221	237,580	774,996
October	553,545	555,981	356,626	534,278

Kam Water Heater Co., Brooklyn, N. Y., has increased its capital from $5,000 to $20,000.

Industrial Business Changes

PRICE IRON & STEEL CO., Peoples Gas building, Chicago, has opened a branch office in the Plankinton arcade, Milwaukee, in charge of Howard A. Bateson, formerly with the Jones & Laughlin Steel Corp., Pittsburgh, and Rogers, Brown & Crocker Bros. Buffalo.

* * *

Shere Grease Gun Corp., New York, has changed its name to the Shere Metal Products Corp.

* * *

Moore Special Tool Co., Bridgeport, Conn., has taken over the selling rights for Willard spring toolholders.

* * *

Grand Rapids Dairy Supply & Equipment Co., Grand Rapids, Mich., has changed its name to Universal Machine Works.

* * *

Kuhn-Lawry Inc., jobber and broker in iron and steel, has moved its offices from the Bowman building to 710 Oliver building, Pittsburgh.

* * *

McWayne Cast Iron Pipe Co., Birmingham, Ala., has opened a sales office at 208 South LaSalle street, Chicago, in charge of Shirley Harris.

* * *

International Steam Motors Corp., Chicago, has changed its name to Railway Locomotive Co. F. F. Norcross, 208 South LaSalle street, is correspondent.

* * *

General Phonograph & Supply Co., Elyria, O., has changed its name to the General Industries Co. It manufactures electrical products.

* * *

Champion Brass Mfg. Co., Coldwater, Mich., has been bought by August C. Vissl, Bronson, Mich. It consists of a brass and aluminum foundry, pattern shop and machine shop.

* * *

United States Cloth Cutting Machine Co. Inc., New York, is in the midst of moving from 414 Broadway to 133 West Twenty-third street, that city. A. R. Comow is purchasing agent.

* * *

J. E. Moss Iron Works, Wheeling, W. Va., has moved its Pittsburgh offices in charge of George L. Ballou, district sales manager, from 809 Keystone building to 414 Bessemer building.

* * *

Stroh-Butler Co., dealer in raw materials for the steel industry, has removed its offices from the Stambaugh building to the new First National Bank building, Youngstown, O.

* * *

Tool Equipment Sales Co., 18 South Clinton street, Chicago, has been appointed sales representative in the Chicago district for the New Process Twist Drill Co., Taunton, Mass.

* * *

Bridgeport Safety Emery Wheel Co., Bridgeport, Conn., has appointed Manning, Maxwell & Moore, Inc., 119 West Fortieth street, New York, its sales representative.

* * *

Edgcomb Steel Co., Eleventh and Cambria streets, Philadelphia, has been appointed warehouse distributor of cold finished bars and sections in the Philadelphia district by the Jones & Laughlin Corp., Pittsburgh.

* * *

Swedish Steel Sales Co. Ltd., Brooklyn, N. Y., has removed to 431 Kent avenue, where it has a warehouse in connection with its offices and carries stock of tool steel, welding wire and other products.

* * *

The Rolls Royce Co. of America, Inc., Springfield, Mass., has acquired control of Brewster & Co., Long Island City, N. Y., manufacturers of automobile coaches. This company founded in 1810 will be operated as a subsidiary of the Springfield company.

* * *

Taylor Stoker Co. Ltd., of Canada and the Cleaton Co. of Canada Ltd., have been merged with the Affiliated Engineering Companies Ltd. This is to create a larger organization in steam, hydraulic and industrial plant equipment.

* * *

Ranson & Orr Co., 819 Dixie Terminal building, Cincinnati, O., dealer in pig iron, coke, and alloys, has moved to 711 Dixie Terminal building, to obtain more space. William S. Ranson and Delvin Orr, president, formerly were with the Matthew Addy Co.

* * *

Machinists Supply Co., Pittsburgh, has been appointed distributor in Western Pennsylvania and northern portion of West Virginia for N. A. Strand & Co. Beals, McCarthy & Rogers, Inc., Buffalo, N. Y., has been given the same commission in western New York.

* * *

The Baker R. & L. Co., Cleveland, has changed its corporate title to the Baker-Raulang Co. It manufactures electric industrial material handling tractors and trucks and closed bodies for automobiles, under trade names that have been incorporated into the new firm name.

* * *

Ziv Steel & Wire Co., Chicago, has been appointed selling agent in Chicago territory for products of the Gilman Mfg. Co., East Boston, Mass. Its territory includes Wisconsin, Indiana, and Minnesota, northern Illinois and part of Michigan. The added line includes rock drills and mining machinery.

* * *

B. Nicoll & Co., 294 Madison avenue, New York, have been made representatives of the Societe Generale pour le Commerce des Produits Industriels, of Luxemburg, for the sale of products of French, Luxemburg and Belgian mills, blast furnaces, coke ovens and coal mines. The company continues its French pipe connection as heretofore.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

ANNISTON, ALA.—M. & H. Valve Co., J. W. Conway president, has let contract to Ogletree Construction Co. for first unit of valve plant 100x390 feet in main building, with cupola, core and cleaning rooms.

LITTLE ROCK, ARK.—Arkansas Foundry Co., East Sixth street, is in the market for a molding machine, cupola and sand blast equipment.

PINE BLUFF, ARK.—Cotton Belt railroad, Daniel Upthegrove president, St. Louis, will remodel and add equipment to car and locomotive shops here.

ALAMEDA, CALIF.—Boyle Mfg. Co., 1918 Park street, manufacturer of metal specialties, is having preliminary plans made for a new plant.

LOS ANGELES—Advance Auto Body Co., 1000 Macy street, will build a 2-story factory 100x160 feet.

LOS ANGELES—Baash-Ross Tool Co. is having plans drawn for a 1-story plant at 5520 South Boyle avenue.

LOS ANGELES—G. N. Easton Corp., San Francisco, Carl J. Gordon general manager, will start work at once on the first unit of its plant here.

LOS ANGELES—Harper Anti-Friction Metal Co. has been formed to establish a plant for the production of alloys for bearings at Wilmington, a suburb.

SAN FRANCISCO—Herman Safe Co., 216 Fremont street, is having plans made for a 1 and 2-story factory at Howard and Main streets for the manufacture of safes and vaults.

DENVER, COLO.—Colorado Fuel & Iron Co. is having plans made for an addition to its cast iron pipe foundry to increase production from 35 to 200 tons per day.

CROMWELL, CONN.—American Hammer Corp. is building a 1-story plant 40x105 feet.

GREENWICH, CONN.—Putnam Corp., 23 West Putnam avenue, will build a 1-story repair and service station 112x206 feet.

HARTFORD, CONN.—Builders Steel Co. is building a 2-story fabricating plant on Midland street.

CLEWISTON, FLA.—Clewiston Iron Co., R. L. Lusk manager, recently organized, will erect fabricating plant with 2000 tons capacity per month and will operate ferry service across lake. (Noted November 26.)

HOLLYWOOD, FLA.—Hollywood Land & Water Co. has let contract to Nordberg Mfg. Co., Milwaukee for two 2250-horsepower diesel engines for its electric power station. A unit of 1250-horsepower has been installed by this maker in this plant.

BERWYN, ILL.—General contract has been awarded to W. J. Zetterell Co., Hamilton County Bank building, Webster City, Iowa, for railroad station to be built by Illinois Central Railway Co., 135 East Eleventh street, Chicago, at a cost of $20,000.

CHICAGO—American Stamping Works, 219 South Peoria street, manufacturer of steel ceilings, will build a 2-story factory 25x78 feet.

CHICAGO—Excelsior Steel Furnace Co., 1226 Hooker street, will build a 2-story addition 28x94 feet. General contract to G. F. Meyne, 127 North Dearborn street.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

CHICAGO—Bell & Howell Co., 1803 Larchmont avenue, motion picture projectors and machinery, will build a 6-story addition 200 x200 feet.

CHICAGO—Maremont Mfg. Co. is taking bids through Halperin & Braun, 19 South LaSalle street, for a 2-story factory and office building on Ashland avenue between Sixteenth and Seventeenth street, 100 x 265 feet.

CHICAGO—Up To Date Machine Co., E. Maurey vice president, 2913 South Wabash avenue, is building a plant addition 45x95 feet. John L. Koster, 112 North La Salle street, is architect.

CHICAGO—Gibson Oat Crusher Co., McCormick building, has been incorporated with $10,000 capital to manufacture oat crushers, corn crackers and kindred products by G. L. Heck Jr., T. J. Flangan and E. D. Green.

CHICAGO—McIntosh Stereopticon Co., 30 East Randolph street, has been incorporated with $10,000 capital to manufacture optical devices by George R. Hogan, Henry T. Price and Henry N. Miller. Gannon & Shea, 127 North Dearborn street, are correspondents.

CHICAGO—MacLean Fogg Locknut Co., 2649 North Kildare avenue, has been incorporated with $5,000 capital to manufacture railway supplies, bolts, nuts and rivets by William H. Odlum, Norris F. McNaught and John A. MacLean. Louis W. Reinecker Jr., 111 West Monroe street, is correspondent.

CHICAGO—No Spindle Axle Co., 1926 South Wabash avenue, has been incorporated with $50,000 capital to manufacture automobiles, power boats, vehicles and airships by C. O. Goetz, Harry A. Shock and Clayton E. Frederickson. Jeremiah B. O'Connell, 106 North LaSalle street, is correspondent.

CHICAGO—White & Hallock, Inc., 30 North Michigan boulevard, has been incorporated with $35,000 capital to manufacture kitchen and household utensils and furnishings by R. O. Farrell, E. W. Hubbard and Jess Halsted. Chapman, Cutler & Parker, 111 West Monroe street, are correspondents.

CHICAGO—Patterson Tool Hardware Co., 30 North Clinton street, has been incorporated with $15,000 capital to manufacture tools, hardware, and electrical fixtures by James J. Patterson, William J. Vonder Lehr and Walter L. Patterson. Elmer W. Arch, 30 North LaSalle street, is correspondent.

CHICAGO—Triplex Washing Machine Corp., 549 West Washington street, has been incorporated with $200,000 capital to manufacture washing machines, laundry machinery and household equipment by John F. Devine Jr., Rudolph Basat and Donald J. Seeley. Frank Posvic, 69 West Washington street, is correspondent.

CHICAGO—Time Saver Mfg. Co., 2841 North Clark street, has been incorporated with $6000 capital and 500 shares no par value to manufacture tools, dies, machinery, electrical and radio apparatus by Philip H. Weber, Dominik M. Bernotow and Rupert J. Weber. Robert D. Elder, 10 South LaSalle street, is correspondent.

MENDOTA, ILL.—H. D. Conkey & Co., manufacturer of cranes and conveying equip-

Exports of Machinery

(Number unless otherwise stated)

	—October—		Ten months ended October	
	1925	1924	1925	1924
Lathes	90	61	1,225	623
Boring and drilling machines	124	197	1,579	2,090
Planers, shapers and slotters	25	18	265	215
Bending and power presses	24	75	326	300
Gear cutters	29	6	365	391
Milling machines	69	46	840	366
Thread cutting and screw machines	99	44	788	594
Punching and shearing machines	17	16	186	166
Power hammers	13	11	187	177
External grinding machines	62	253	1,199	2,578
Internal grinding machines	18	18	265	445
Other grinding and sharpening machines, pounds	89,633	79,202	1,185,782	961,543
Chucks for machine tools	1,286	2,633	21,206	20,270
Reamers, cutters, drills and other metalworking tools, pounds	281,716	181,298	2,994,138	1,590,772
Pneumatic portable tools	1,457	1,538	13,331	11,709
Air compressors	.....	527	.....	5,041
Cranes,				
With swinging booms	6	3	82	44
Other cranes	16	21	150	193
Hoists and derricks, except mining	427	353	4,996	3954
Ball and roller bearing, and parts of chain, pounds	216,240	136,749	1,623,541	2,027,410
Sprocket and power transmission, pounds	331,560	282,301	2,576,118	3,313,311
Other chains, pounds	1,164,561	856,763	10,962,555	8,475,012

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old Range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.00
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, f.o.b. cars Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent	9.75 to 10.00
Riff low phosphorus, 65 to 66 per cent	9.50 to 10.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent	9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent	8.50 to 9.00
Algerian foundry and basic, 50 to 54 per cent	8.50 to 9.00

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent.....nominal
Indian minimum 47 per cent.....nominal
Caucasian, 53 to 55 per cent.....
....Washed, 41 to 43 cents c.l.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton..	$17.50
Washed gravel, imported duty paid eastern tidewater, per net ton	16.50 to 17.50

ment, is building a 1-story addition 90x140 feet. General contract to the Austin Co.

EAST ST. LOUIS, ILL.—Southern Malleable Iron Works, Bond avenue and Twenty-first street, is building a foundry addition.

BRAZIL, IND.—Building Brick Co. of Illinois, planning a plant here, will buy a steam shovel, steel dump cars and brick making machinery and two boilers.

CAMBRIDGE CITY, IND.—Mal-Gray Castings Co. has been incorporated with $100,000 capital to manufacture malleable castings by Harry Bachman, Edna L. Bachman and Grace E. Bullerdick.

COLUMBUS, IND.—Cummins Engine Co., Jackson and Sixth streets, will start construction at once on the first unit of its new plant, 1-story 50 x 130 feet, to be followed by a second unit 125 x 290 feet. C. L. Cummins is president.

GARY, IND.—Defiance Heating Co., Inc., 729 Broadway, recently incorporated company with $250,000 capital, will manufacture hot water, steam and hot air heating systems, and is in the market for plate bending rolls, welding machinery and drill presses.

HAMMOND, IND.—Standard Steel Car Co. has let contract for a steel shop building 80 x 335 feet.

INDIANAPOLIS, IND.—Holt Tool & Engineering Co., 814 East Washington street, will build a 1-story plant 42 x 90 feet for the manufacture of screw machines and parts. Charles D. Hoyt is president of the company.

KOKOMO, IND.—Turner Mfg. Co., manufacturer of automobile accessories, is planning an addition to its plant.

LAPORTE, IND.—Howser Valve Tool Mfg. Co. has been incorporated with $50,000 capital to manufacture tools by Walter M. Howser, Ernest W. Hunt, Andrew Doll and Eugene Grambo.

MISSOURI VALLEY, IOWA—Chicago & Northwestern railroad will rebuild railroad yards destroyed by fire to cost $25,000.

SIOUX CITY, IOWA—Illinois Central Ry. Co., 135 E. 11th street, Chicago, Ill., contemplates enlarging yards and installing new equipment.

HUTCHINSON, KANS.—Massey-Harris Co., M. H. Whitaker manager, Easley street, will build a 1 and 2-story addition 120 x 140 feet and 33 x 45 feet. General contract to the Clickner Construction Co., 24 West Second street.

KANSAS CITY, KAN.—Massey-Harris Harvester Co. Inc., John W. Hugg manager, 1304 West Twelfth street, will build a 1-story assembling plant 120x140 feet. General contract to Clickner Construction Co., 24 West Second street, Hutchinson, Kan.

BALTIMORE, MD.—Flynn & Emrich Co., Saratoga and Holliday streets, will build foundry plant 100x260 feet on Garrett avenue. W. S. Austin, Maryland Trust building, is engineer.

BOSTON—Massachusetts Wharf Coal Co., 30 Kilby street, is building a 1-story repair shop and garage 77x164 feet at Harvard and Main streets, Cambridge.

LOWELL, MASS.—Boston Auto Supply Co., 96 Bridge street, is building a 1-story supply and repair shop 46x200 feet.

SPRINGFIELD, MASS.—Springfield Bronze Co., Joseph R. Gould president, has leased a 1-story plant 80x100 feet on Page Boulevard.

WEST LYNN, MASS.—General Electric Co. is building an oxygen and hydrogen unit 60x 100 feet at its works here.

WORCESTER, MASS.—Wyman-Gordon Co., automobile forgings, will build a 1-story addition. General contract to E. J. Cross Co., Worcester.

BAY CITY, MICH.—Bay City Dredge Works, Inc., dredges and machinery, will build a 1-story addition 50 x 100 feet.

DETROIT—Budd Wheel Co. has awarded a contract to the Wark Co. for an addition to its plant.

DETROIT—Cadillac Motor Car Co. is taking bids through Albert Kahn, architect, for an assembly plant.

DETROIT—Triangle Tool Co. has awarded a contract for a 1 and 2-story building, 50 x 100 feet, to Janke, Venman & Krecke, architects and engineers.

DETROIT—Long Mfg. Co., East Grand boulevard, manufacturer of automobile radiators and accessories, will build a 1-story addition. Roger F. Hill has the general contract.

DETROIT—Detroit Insulated Wire Co., care the Austin Co., general contractor, 2201 First National Bank building, will build a 1-story addition 20x60 feet.

DETROIT—Crittall Casement Window Co., A. C. Read secretary, 10951 Heran avenue, will build a 1 and 2-story plant addition 80x 300 feet. General contract to the Albert A. Albrecht Co., Penobscot building.

DETROIT—Britnall Mfg. Co. has been incorporated with $100,000 capital to manufacture sewing machines, tools and machinery by W. E. Alpeters, Royal Oak; B. L. Auger and Spencer L. Alden, 11535 Byron avenue.

DETROIT—Alloys Foundry Co. has been incorporated with $75,000 capital to manufacture iron, steel and metals by R. L. Spitzley, E. O. Jakel and A. M. Thompson, 19 West Woodbridge street.

LANSING, MICH.—Michigan Sheet Metal works is building an additional unit to enlarge its production.

LANSING, MICH—Federal Drop Forge Co. is making additions to its plant and installing additional hammers.

MENOMINEE, MICH.—Prescott Co. is building a 1-story addition to its machine shop 92 x 140 feet.

MUSKEGON, MICH.—Enterprise Brass Works is having plans made for a foundry addition to be built at once.

NEWAGO, MICH.—Pike Laboratories, Inc., newly incorporated to manufacture automobile accessories, will build a plant here. Henry Roew is president.

PONTIAC, MICH.—Grand Trunk railroad, C. K. Bowker general manager, 400 East Jefferson street, Detroit, will build a roundhouse and machine shop for which plans are being outlined.

DULUTH, MINN.—Minnesota Power & Light Co. has awarded general contract to J. D. Harrold, 125 East First street, for repairs to building at 410 Commerce street to cost $15,000.

MINNEAPOLIS, MINN.—Gopher Stone Co., 1500 Johnson street, will build and equip an addition to its stone crushing plant. General contract to Pike & Cook Co., 416 South Fifth street.

MONTGOMERY, MINN.—J. B. Nelson Construction Co., 503 Belgrade avenue, Mankato, Minn., has been awarded general contract for canning factory costing $150,000 to be built by Minnesota Valley Canning Co.

ST. PAUL, MINN.—Mack International Motor Truck Corp., 2234 University avenue, will build assembling plant at University avenue and Cromwell street to cost $400,000.

ST. PAUL, MINN.—Andrews Heating Co., 527 Fifth street, is building a 1-story 66x165 boiler and machine shop at 2601 Fourth street SE, to cost $15,000.

ST. PAUL, MINN.—Automatic Vehicle Tag Co., C. W. Sersen president, 348 South Robert street, will build a 1-story factory building 50x115 feet.

JACKSON, MISS.—Martin-Parry Corp., H. C. Yawn Jr., manager, will build an auto

truck body plant 200x250 feet and will require equipment.

JACKSON, MISS.—Illinois Central raliroad Co., 135 East Eleventh street, Chicago, has awarded general contract to Gould Construction Co., 517 Well avenue, Davenport, Iowa, for track elevation and subway work to cost $1,000,000.

KANSAS CITY, MO.—Steel Mfg. & Warehouse Co., D. S. Rettig president, 1449 Genessee street, will build an addition containing 10,000 square feet and will require additional equipment.

ST. LOUIS—Safety Switch Lever Lock Corp. of America has been incorporated to manufacture railroad signals by Harry L. Israel, 5928 Waterman street and others.

ST. LOUIS—Liberty Foundry Co., 7600 Vulcan street, is building a 1 and 2-story foundry 90 x 160 feet and 30 x 30 feet on South Thirty-eighth street.

ST. LOUIS—Inland Waterways Corp., 1016 Munitions building, Washington, D. C., has pledged aid in building joint rail and water terminals at Helena, Ark. and Baton Rouge, La.

ST. LOUIS—Hicks Retinning & Mfg. Co. has been incorporated with $15,000 capital to retin, plate and finish metal objects by Linzy Hicks, Samuel H. Hicks, Webster Groves, Mo., and Charles C. Fremon, Leeper, Mo.

ST. LOUIS—Barton Mfg. Co., William A. Clark manager, 312 South Eighth street, will build a 2-story plant 130x170 feet at 4157 North Kingshighway. General Contract to Widmer Engineering Co., Laclede Gas building.

ST. LOUIS—Standard Underground Cable Co., E. J. Plethker manager, Arcade building, will build a 2-story addition 52x90 feet at Kingshighway and Silvia avenue. General contract to Widmer Engineering Co., Laclede Gas building.

ST. LOUIS—Tite-Lock Roofing Co. of St. Louis has been incorporated to manufacture roofing materials with $2500 capital by L. M. Sandoe, D. H. Rouse, G. M. Sandoe and Thomas Bronenkamp. Kratky & Zeppenfeld, 627 Planters building, are attorneys.

FAIRBURY, NEB.—The Fairbury Gladstone Light & Power Co., has been incorporated with a capital of $10,000 by J. W. Boock and R. C. King.

GRAND ISLAND, NEB.—Bids are being taken by Henry E. Clifford, city clerk, until Dec. 15, for 2700 horsepower water tube boilers, estimated by engineer at $22,000 each and two mechanical stokers, estimated at $11,500 each. Pillsbury Engineering Co., 2344 Nicollet avenue, Minneapolis, and 716 Capital Bank building, St. Paul, are engineers.

OMAHA, NEB.—Nebraska Automobile & Truck Mfg. Co., contemplates building truck factory.

OMAHA, NEB.—Metropolitan Utilities District, City Hall, will build a 2-story garage and repair shops at Twentieth and Center streets. T. A. Leisen is engineer.

BLOOMFIELD, N. J.—American La France Fire Engine Co., Elmira, N. Y., will enlarge its plant here for manufacture of trucks and buses.

CARLSTADT, N. J.—Safety Valve Corp. has been incorporated with $50,000 capital to manufacture valves and appliances by Emil Freud, Carlstadt; Daniel F. Kruger, New York, and Rosa Freud, Brooklyn. Alva Collins, New York, is attorney.

HOBOKEN, N. J.—Lawson Auto Specialty Co. has been incorporated with $10,000 capital to manufacture accessories by Hilma E. Pierson, Jeanne Impoment, Hoboken, and John D. Pierson, Weehawken. Pierson & Schroeder, Hoboken, are attorneys.

Refractories

FIRE CLAY BRICK
Per 1000 f.o.b. works

Pennsylvania, No. 1	$43.00 to 46.00
Pennsylvania, No. 2	35.00 to 40.00
Ohio, No. 1	43.00 to 46.00
Ohio, No. 2	38.00 to 40.00
Illinois, No. 1	40.00 to 43.00
Illinois, No. 2	35.00 to 38.00
Kentucky, No. 1	43.00 to 45.00
Kentucky, No. 2	40.00 to 43.00
Missouri, No. 1	43.00 to 46.00
Missouri, No. 2	35.00 to 38.00
Maryland, No. 1	43.00 to 47.00
Maryland, No. 2	39.00 to 42.00

SILICA BRICK

Pennsylvania	40.00
Chicago	49.00
Birmingham	48.00 to 52.00

MAGNESITE BRICK
Per Net Ton Seaboard Base

9 x 4½ x 2½	65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	45.00 to 48.00

IRVINGTON, N. J.—A 1-story foundry addition will be erected by the Atlas Foundry Co.

NEWARK, N. J.—Contract has been awarded by Motor Improvement, Inc., for the erection of a $200,000 manufacturing plant.

NEWARK, N. J.—The Shupe Terminal Co. will erect a freight warehouse near Port Newark, and has recently placed structural steel for the project.

NEWARK, N. J.—Star Electric Motor Co., E. E. Hollander president, 142 Miller street, is building a 2-story plant 70x88 feet. General contract to Essex Construction Co., 9 Hackett street, Newark.

NEWARK, N. J.—Havell Mfg. Co., 284 Washington street, metal products manufacturer, will build a 1-story plant on Coit street, Irvington, N. J., equipping with present and additional machinery.

NEWARK, N. J.—Motor Improvements Inc., 365 Frelinghuysen avenue, automotive equipment and accessories, will build a 2-story plant 100x200 feet. General contract to White Construction Co., 95 Madison avenue, New York.

NEWARK, N. J.—Roice Tube Corp. has been incorporated with $125,000 capital to manufacture radio supplies by David Meyers, Edward Wood, Newark, and Howard Wall, East Orange, N. J. David M. Litwin, Newark, is attorney.

NEWARK, N. J.—Rankin-Kennedy Foundry, Inc., 111 Gotthart street, has been incorporated with $125,000 capital to manufacture gray iron and special steel castings. It has taken over the Morrison foundry for its production.

TRENTON, N. J.—The DeLaval Steam Turbine Co. has awarded structural steel for a foundry addition to the McClintic-Marshall Co.

ALBANY, N. Y.—Empire Plating Works, F. Mende manager, will build a 3-story plant addition 25x34 feet.

Brooklyn, N. Y.—Brooklyn Boiler & Radiator Corp. has been incorporated with $20,000 capital by B. Myers and J. Myers. P. F. Rosenberg, 215 Montague street, is attorney.

BROOKLYN, N. Y.—Krisechers Mfg. Co., 265 Cayler street, manufacturer of metal specialties, will build a 3-story addition 100x165 feet. General contract to Charles Salenger & Son, 192 Freeman street.

BUFFALO, N. Y.—George W. Herlan Co. has been incorporated with $5000 capital to manufacture plumbers' supplies by E. Herlan, G. A. Patterson and J. H. Neuman. Saperston, McNaughton & Saperston, Buffalo, are attorneys.

HYDE PARK, N. Y.—Overton Mfg. Co. has been incorporated with 300 shares common stock no par value to operate a machine shop by R. T. Overton, E. B. Hughes and R. A. Schmucker.

KINGSTON, N. Y.—Kingston Auto-o-Matic Heating Co. has been incorporated with $5000 capital by G. F. Diamond, R. P. Conway and W. J. Conway, Kingston, is attorney.

LONG ISLAND CITY, N. Y.—The American Railway Express Co. has placed structural steel with the Shoemaker Bridge Co. for the erection of a freight terminal here.

MASSENA, N. Y.—Aluminum Co. of America, A. E. Vail manager, is building an addition 60x100 feet. General contract to the Austin Co.

NEW YORK—Simes Co., 22 West Fifteenth street, will rebuild its burned plant. Company manufactures lighting fixtures.

NEW YORK—Pan American Iron Works is increasing facilities for production and has occupied larger plant quarters at 447 East 120th street.

NEW YORK—United Scrap Iron & Steel Co. has been incorporated with $10,000 capital by I. Rutstein, A. Guira and A. F. Rosenbaum. R. N. Trebitsch, 113 Henry street, is attorney.

NEW YORK—L. & K. Iron Works has been incorporated with $10,000 capital by L. Kvatinetz, G. Movshovitch and I. Rose. L. J. Paley, 185 Madison avenue, is attorney.

NEW YORK—Audiphone Mfg. Corp. has been incorporated with $10,000 capital to manufacture electrical equipment by D. A. Reynolds, E. A. Reynolds and H. S. Naul.

NEW YORK—Paramount Hardware Corp. has been incorporated with $250,000 capital to manufacture locks by J. B. Baron, B. E. Stearns and E. Young, 405 Lexington avenue.

NEW YORK—Olney Machinery Co. has been incorporated with $5000 capital by M. F. Cohn, L. Rosenburg and G. H. Olney. J. S. Rosenberg, 15 Park Row, is attorney.

NEW YORK—Vacuol Heat & Power Co. has been incorporated with $10,000 capital by E. Lieberson and B. Honig. A. E. Shepherd, 128 West Thirty-first street, is attorney.

NEW YORK—Penn Seating Co. has been incorporated with $25,000 capital to manufacture school seats and supplies by J. L. Brenner, F. A. McKernan and M. A. Langer. I. B. Schieber, 51 Chambers street, is attorney.

NEW YORK—Dillon-Parker Corp. has been incorporated with $10,000 capital to manufacture copper products by M. Shapiro, I. J. Sikawitt and H. Litbin. Shapiro & Sikawitt, 140 West Forty-second street, are attorneys.

NEW YORK—William H. Wiemann & Co., have been incorporated with $25,000 capital to manufacture hardware by W. H. Wiemann, and H. J. Eckelmann. C. W. Philipbar, 215 Montague street, Brooklyn, is attorney.

NEW YORK—Josephson Bros. has been incorporated with $10,000 capital to manufacture automobile accessories by T. Berger, P. Sprung and B. Helfenstein. W. L. Abrams, 132 Nassau street, is attorney.

NEW YORK—Ideal Roof & Skylight Works, has been incorporated with $20,000 capital by H. Bellet, S. Cohn, and V. Raphaer. Cat-

tano & Gilman, 116 Nassau street, are attorneys.

NEW YORK—Peerless Wrench Co. has been incorporated with $100,000 capital to manufacture wrenches and other appliances by J. Hill and J. Keegan. J. T. Cashman, 30 Church street, is attorney.

NEW YORK—A new fabricating shop will be erected by the Dreier Iron Works, Inc., 338 East Fifty-ninth street, on recently acquired property at Avenue D and East Eleventh street.

NEW YORK—Master Wire Die Corp. has been incorporated with $100,000 capital to manufacture wire drawing machinery by D. Frieberger, J. Frieberger and J. A. Massel. D. and J. Frieberger, 1262 Broadway, are attorneys.

NEW YORK—Wise Mfg. Co. has been incorporated with $15,000 capital to manufacture radio supplies and appliances by F. Isenberg, H. K. Golenbock and F. Dowdy. Wight, Wight & Golenbock, Perth Amboy, N. J., are attorneys.

NEW YORK—Moylan Supply Co. has been incorporated with 500 shares at $100 each and 100 common no par value to manufacture plumbers supplies by C. S. Hirschfeld, L. Cohen and A. Scherl. J. L. Young, 25 Broadway, is attorney.

NEW YORK—Portable Light Co. has been incorporated with 150 shares at $100 each and 150 shares common stock no par value to manufacture searchlights by J. S. McRea, M. V. Boom and A. F. Steeber. S. T. Carter Jr., 111 Broadway, is attorney.

NEW YORK—The Westinghouse Lamp Co., 150 Broadway awarded a contract to Stone & Webster, Inc., Boston, for the erection of a $45,000 plant addition at Bloomfield, N. J. The proposed structure to be two stories high, 93 x 115 feet.

NEW YORK—Trucometer Corp. of America has been incorporated with 5000 shares at $10 each and 5000 common no par value to manufacture recording devices by F. J. Brown, H. Fabricant and D. Sutherland. M. & S. Myers, Broadway and Forty-second street, are attorneys.

NIAGARA FALLS, N. Y.—Niagara Coke Corp. has been incorporated with 1000 shares no par value to operate a coke plant by P. A. Schoellkopf, J. E. Schoellkopf Jr. and A. Smith. Cohn, Chormann & Franchot, Niagara Falls, are attorneys.

OLEAN, N. Y.—Kolp Co. Inc., manufacturer of metal novelties, is building a 1-story factory at Ellicottville, N. Y., for which handling and transmission equipment and tools will be required.

ROCHESTER, N. Y.—Todd Co., manufacturer of check protectors, is building a 2-story addition 100x140 feet. General contract to the H. K. Ferguson Co., Cleveland.

SYRACUSE, N. Y.—Arnold Door & Window Corp. has been incorporated with $25,000 capital by F. P. Arnold, R. M. Arnold and L. E. Orcutt. L. L. Dutton, Syracuse, is attorney.

SYRACUSE, N. Y.—Lloyd A. Hungerford Co. has been incorporated with $10,000 capital to manufacture sheet metal products by L. A. Hungerford, A. W. Beacham and F. J. Creamer. J. R. Enders, Syracuse, is attorney.

CANTON, O.—Republic Tool Products Co., Dayton, O., will build a 4-story fireproof factory building 60 x 80 feet to increase productive capacity.

CINCINNATI—Applegate & Mohs Co., 3542 Spring Grove avenue sheet metal products, is building a 1-story addition 60 x 120 feet.

CINCINNATI—Breese Bros. Co., 2347 Reading road, roofing and sheet metal products, is building and equipping a 1-story addition. J. R. Stevens & Co., St. Bernard, O., have the general contract.

CLEVELAND—Carnegie Body & Top Co., I. O. Weisenblatt vice president, 6115 Carnegie avenue, is having plans drawn for a 3-story addition.

CLEVELAND—Federal Gear Inc. has been incorporated with $500 capital by Ralph W. Edwards, Edward Barker, M. E. Hundmiller, G. E. Schwarm and E. B. Lederle.

CLEVELAND—Universal Steel Co. has been incorporated with $500 capital by Sydney N. Galvin, Harry Resnick, Alexander Miller, J. Miller and Lewis Miller.

DAYTON, O.—Republic Tool Products Co. is building a 4-story plant 60x80 feet. General contract to Miami Valley Building Co., Dayton.

HAMILTON, O.—Hamilton Autographic Register Co., 416 Ross avenue, will build a 1-story addition 50 x 142 feet. C. A. Ervin & Co., Hamilton, has the general contract.

SPRINGFIELD, O.—American Radiator Co., West Main street, J. B. Orbison manager, will build an addition, including coke storage, sand bins and machinery.

WARREN, O.—Frost Steel Products Inc. has been incorporated with $500 capital by Olive Murphy, Fannie Stevenson, Elizabeth Baldwin, Gertrude Wilkins and Mary Hayes.

Business in Canada

WINNIPEG, MANN.—Following signing of contract between Spanish River interests and the Manitoba Power Co., for power for the new paper mill to be erected by Spanish River interests the power company will install an additional 28,000-horsepower development unit, in addition to the present plant generating 56,000 horsepower. Following the completion of the proposed unit, another of the same horsepower will be installed, which will give the Manitoba Power Co., a total output of 112,000 horsepower.

SMITHFIELD, N. S.—The Leadville Development Co., will start work immediately on the construction of a smelter here.

GUELPH, ONT.—The Guelph Stove Co., York road, has awarded contracts and construction work has started on a foundry addition here. Necessary equipment will be purchased later.

WINDSOR, ONT.—The Chrysler Motor Co., McDougall and Tecumseh streets, has awarded contracts and construction work is under way on a $42,000 addition to its plant here. Some equipment and tools will be purchased.

WINDSOR, ONT.—The L. A. Young Industries, Ltd., McDougall street, has let the general contract to the John V. Gray Construction Co., for a factory building here to cost $120,000. Construction is under way and equipment will be required.

BOUTOUCHE, QUE.—The J. D. Irving Co., will rebuild plant recently destroyed by fire with a loss of $25,000.

KINGDON, QUE.—The Kingdon Mining & Smelting Co., 314 Beaver Hall hill, Montreal, Que., erecting lead and zinc plants here have started to purchase equipment and have awarded contracts for motors to the Canadian Westinghouse Co.

MONTREAL, QUE.—F. Trifilette, 300 Hurteau street, is asking for a small lathe, compressor and miscellaneous tools.

MONTREAL, QUE.—N. Metsos, 135 Clark street, is asking for woodworking machinery including saws, etc.

MONTREAL, QUE.—The Frontenac Foundry Co., Le Pailleur street, will build addition to its foundry here and is interested in equipment.

MONTREAL, QUE.—X. Rochon, 1000 St. Andre street, will build garage and repair shop on Chateaubriand street, and is interested in equipment.

New Trade Publications

BLOWERS—Mine fans are featured in a leaflet by the American Blower Co., Detroit, which describes one type and gives full engineering data.

STEEL FLANGES—Forged steel flanges produced by the American Spiral Pipe Works, Chicago, are described in a bulletin by that company, with data as to their availability and use in engineering work.

PRESSES—Machines for sheet metal working as produced by the Niagaga Machine & Tool Works, Buffalo, N. Y., are presented in a leaflet by that company, calling attention to the need of presses to obtain and hold steady production.

BOILER OPERATION—Andrews-Bradshaw Co., Pittsburgh, manufacturer of boiler specialties, is distributing a pamphlet containing a study of concentration in boilers, with some remedies for difficulties resulting from this action.

CHUCKS—Hannifin Mfg. Co., Chicago, has isued a catalog of its air operated chucks, countershafts, clamping devices, expanding mandrels and vises. It is well illustrated and contains specifications and other information of value to the engineer and mechanic.

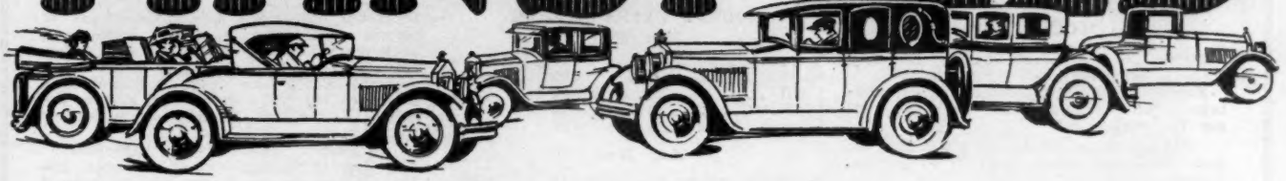
BORING BARS—Production at minimum cost through the medium of boring bars is presented in a bulletin by the Hannifin Mfg. Co., Chicago. It is well illustrated and information as to proper use and adjustment of the bars is given.

SPEED REDUCERS—Modern speed reduction is treated in a pamphlet by the Boston Gear Works, Norfolk Downs, Quincy, Mass. Various types of speed reducers, with full engineering data make the booklet valuable to users of machinery.

CATERPILLAR TRACTORS—Traction by mechanical power as contrasted with the horse, the possibility of doing things beyond the range of flesh power. Details of the caterpillar tractor and some illustrations of applications are presented in a leaflet by the Caterpillar Tractor Co., San Leandro, Calif.

MILLING MACHINES—Kearney & Trecker, Milwaukee, have published a series of bulletins illustrating their line of millers. Full details of construction, operation and accomplishment are presented, with specifications for the various types.

MANSFIELD



Automobile Sheets

Many of the largest and best known Automobile Manufacturers come to Mansfield for steel sheets. Cars in every price class benefit from the use of this scientifically manufactured material. Its rare excellence permits manufacturers to produce remarkable smooth finishes.

Mansfield Automobile Sheets are rolled from Mansfield-poured ingots. This distinctive method of pouring combined with scientific treatment of the metal in the open-hearth furnace accounts for their exceptional purity.

Mansfield Automobile Sheets are available to manufacturers in all grades of Body Stock, Flat Fender and Hood Stock, Radiator Casing Stock, Crown Fender Stock.

OTHER MANSFIELD SPECIALTIES: "Wabik Metal" Sheets for Vitreous Enameling, Metal Furniture Sheets, Milk Can Stock, Electrical sheets, Pickled and Annealed Enameling Stock for Kitchen Utensils, *Sheet Bars* and *Ingots*.

Mansfield Sheet & Tin Plate Company

Mansfield, Ohio

District Sales Offices:
12-237 General Motors Bldg., Detroit, Mich.
1372 Wrigley Bldg., Chicago, Ill.
410 Pierce Bldg., St. Louis, Mo.
1106 National City Bldg., New York, N. Y.
2002 Union Trust Bldg., Cleveland, Ohio
1504 West Venango Street, Philadelphia, Pa.

Contributing Member
SHEET STEEL
TRADE EXTENSION COMMITTEE

District Sales Offices:
1403 Merchants Bank Bldg., Indianapolis, Ind.
1020 Union Trust Bldg., Cincinnati, Ohio
640 Endicott Bldg., St. Paul, Minn.
237 Rialto Bldg., San Francisco, Calif.
509 Wilcox Bldg., Los Angeles, Calif.
1426 L. C. Smith Bldg., Seattle, Wash.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount or $4 per ton higher net.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis or $5 per ton higher net.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	46	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	45½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	12½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	33	25½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis

THREADS AND COUPLINGS

Butt Weld

⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾-inch	30	18
1 to 1½-inch	30	18

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
8 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾ to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
8 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
½-inch	+28	+40
1-inch	+34	+40
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
4¼ to 8¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent	55 off
Carbon, 0.30 to 0.40 per cent	50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per Pound for Width or Diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼ inch thick and heavier.

GAGE

Plates not Exceeding 72 inches Wide

Plates less than ¼-inch gage, to and including ⅜-inch; or lighter than 10.2 pounds per square foot to and including 7.65 pounds per square foot 20c

Plates Over 72 inches Wide

Plates less than ¼-inch gage, to and including ⅜-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull material subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept., or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection ..... No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH or DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet....No extras

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.25c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra ..... .20c